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Volume II - Appendices
Final Environmental Impact Statement for the Silver State Solar Energy Project
DOI No. FES 10-50

Bureau of Land Management
Las Vegas Field Office

September 2010

BLM
Las Vegas Field Office

U.S. DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

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Table of Contents
Volume II

Appendix A	Emissions Calculations
Appendix B	Biological Mitigation Measures
Appendix C	Visual Resources Contrast Rating Forms
Appendix D	Conceptual Drainage Study
Appendix E	Groundwater Availability Study
Appendix F	Draft EIS Public Comments and BLM Responses

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A Emissions Calculations

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Appendix A

Air Quality/GHG Emission Calculations

Part A – Emission Calculations for Construction Activities

Part B- Emission Calculations for Operational Activities

Part C- Emission Calculations for Decommissioning Activities

Emission Calculations for Construction Activities
NextLight SilverState Solar Project

Table No.	Table Description
Table A1	Summary of Total Construction Emissions
Table A2	Summary of Construction Emissions by Year
Table A3	Comparision of Yearly Construction Emissions to General Conformity De Minimis Thresholds
Table A4	Summary of Daily Construction Emissions
Table A5	Emission Factors for Diesel Non-Road Construction Equipment
Table A6	Emissions from Diesel Non-Road Construction Equipment - Section 1
Table A7	Emissions from Diesel Non-Road Construction Equipment - Sections 2 and 3
Table A8	On-Road Construction Vehicle Usage
Table A9	On-Road Construction Vehicle Exhaust Emission Factors
Table A10	Exhaust Emissions from On-Road Construction Vehicles
Table A11	Fugitive Dust Emission Factors - Roads
Table A12	Fugitive Dust Emissions from On-Road Construction Vehicle Travel on On-Site and Off-Site Roads
Table A13	Fugitve Dust Emissions from On-Site Construction Activities - Section 1
Table A14	Fugitve Dust Emissions from On-Site Construction Activities - Sections 2 and 3

Table A1
Summary of Total Construction Emissions
NextLight SilverState Solar Project

Construction Phase	Construction Emission Source	Total Criteria Pollutant Emissions (tons)						GHG Total Emissions (metric tons)		
		VOC	CO	NO_x	SO_2	PM_{10}	$PM_{2.5}$	CO_2	CH_4	CO_2-e
Section 1	Combustion Emissions: Non-Road Equipment	1.9	10	23	0.37	1.9	1.9	3,477	-	3,477
	Combustion Emissions: On-Road Vehicles	2.3	23	6.1	0.03	0.4	0.30	2,511	0.15	2,514
	Fugitive Dust: On-Site Construction	-	-	-	-	33	4.7	-	-	-
	Fugitive Dust: On-Site and Off-Site Roads	-	-	-	-	68	6.5	-	-	-
	Subtotal	**4.2**	**33**	**29**	**0.40**	**104**	**13**	**5,987**	**0.15**	**5,991**
Sections 2 and 3	Combustion Emissions: Non-Road Equipment	6.8	35	80	1.3	6.9	6.9	12,283	-	12,283
	Combustion Emissions: On-Road Vehicles	5.5	56	14	0.07	0.9	0.7	6,279	0.36	6,287
	Fugitive Dust: On-Site Construction	-	-	-	-	124	18	-	-	-
	Fugitive Dust: On-Site and Off-Site Roads	-	-	-	-	182	17	-	-	-
	Subtotal	**12**	**91**	**94**	**1.4**	**313**	**42**	**18,562**	**0.36**	**18,570**
TOTAL		**17**	**124**	**123**	**1.8**	**416**	**56**	**24,549**	**0.51**	**24,560**

Table A2
Summary of Construction Emissions by Year
NextLight SilverState Solar Project

Year	Phase	Emissions1 (tons)						GHG Total Emissions (metric tons)		
		VOC	CO	NO_x	SO_2	PM_{10}	$PM_{2.5}$	CO_2	CH_4	CO_2-e
2011	Section 1	4.2	33	29	0.40	104	13	5,987	0.15	5,991
2012	Sections 2 and 3[1]	2.5	18	19	0.28	63	8.5	3,712	0.07	3,714
2013	Sections 2 and 3[1]	4.9	37	38	0.55	125	17	7,425	0.14	7,428
2014	Sections 2 and 3[1]	4.9	37	38	0.55	125	17	7,425	0.14	7,428
Total		**17**	**124**	**123**	**1.8**	**416**	**56**	**24,549**	**0.51**	**24,560**

Notes:

1. Assumed overall equipment and vehicle usage (and associated emissions) for construction work for Sections 2 and 3 divided into the calendar years as follows: 20% for Year 2012; 40% for Year 2013; and 40% for Year 2014.

Table A3
Comparision of Yearly Construction Emissions to General Conformity De Minimis Thresholds
NextLight SilverState Solar Project

Hydrographic Area	Year	Phase	Emissions (tons)			
			VOC	CO	NO_x	PM_{10}
164A and 164B	2011	Section 1	2.8	20	25	100
	2012	Sections 2 and 3	1.8	13	17	61
	2013	Sections 2 and 3	3.6	25	34	121
	2014	Sections 2 and 3	3.6	25	34	121

Hydrographic Area	Year	Phase	Emissions (tons)			
			VOC	CO	NO_x	PM_{10}
165	2011	Section 1	0.30	2.6	0.88	0.80
	2012	Sections 2 and 3	0.14	1.2	0.40	0.40
	2013	Sections 2 and 3	0.28	2.4	0.80	0.80
	2014	Sections 2 and 3	0.28	2.4	0.80	0.80

CO and PM_{10} Nonattainment Area

Hydrographic Area	Year	Phase	Emissions (tons)			
			VOC	CO	NO_x	PM_{10}
212	2011	Section 1	1.1	9.6	3.2	2.9
	2012	Sections 2 and 3	0.5	4.4	1.5	1.5
	2013	Sections 2 and 3	1.0	8.9	2.9	2.9
	2014	Sections 2 and 3	1.0	8.9	2.9	2.9
General Conformity De Minimis Threshold			-	**100**	-	**70**

Ozone Nonattainment Area

Hydrographic Area	Year	Phase	Emissions (tons)			
			VOC	CO	NO_x	PM_{10}
All Areas	2011	Section 1	4.2	33	29	104
	2012	Sections 2 and 3	2.5	18	19	63
	2013	Sections 2 and 3	4.9	37	38	125
	2014	Sections 2 and 3	4.9	37	38	125
General Conformity De Minimis Threshold			**100**	-	**100**	-

Table A4
Summary of Daily Construction Emissions
NextLight SilverState Solar Project

Construction Phase	Construction Emission Source	Daily Emissions (lbs/day)					
		VOC	CO	NO_x	SO_2	PM_{10}	$PM_{2.5}$
Section 1	Combustion Emissions: Non-Road Equipment	45	233	546	8.4	44	44
	Combustion Emissions: On-Road Vehicles	24	251	61	0.3	3.9	3.0
	Fugitive Dust: On-Site Construction	-	-	-	-	784	112
	Fugitive Dust: On-Site and Off-Site Roads	-	-	-	-	798	76
	Total	**69**	**484**	**607**	**8.7**	**1,631**	**235**
Sections 2 and 3	Combustion Emissions: Non-Road Equipment	41	215	488	7.9	42	42
	Combustion Emissions: On-Road Vehicles	23	238	55	0.3	3.7	2.8
	Fugitive Dust: On-Site Construction	-	-	-	-	784	112
	Fugitive Dust: On-Site and Off-Site Roads	-	-	-	-	798	76
	Total	**64**	**453**	**544**	**8.2**	**1,628**	**232**

Table A5

Emission Factors for Diesel Non-Road Construction Equipment

NextLight SilverState Solar Project

Construction Equipment Assumptions		Emission Factor Data[1]									
						Emission Factor[2] (g/hp-hr)					
Equipment Type	Equipment Engine Size (hp)	Equipment Used for Emission Factor	SCC	Equipment Size Range	Fuel Type	VOC	CO	NO_x	SO_2	PM	CO_2
Scraper	300	Scrapers	2270002018	175 < hp ≤ 300	Diesel	0.243	1.106	3.259	0.052	0.227	536.069
Tractor	300	Crawler Tractor/Dozers	2270002069	175 < hp ≤ 300	Diesel	0.241	1.099	3.228	0.052	0.225	536.075
Motor grader	200	Graders	2270002048	175 < hp ≤ 300	Diesel	0.239	1.095	3.197	0.052	0.224	536.081
Excavator	195	Excavators	2270002036	175 < hp ≤ 300	Diesel	0.229	1.082	3.044	0.052	0.221	536.112
Dozer	300	Crawler Tractor/Dozers	2270002069	175 < hp ≤ 300	Diesel	0.241	1.099	3.228	0.052	0.225	536.075
Dump truck	275	Off-Highway Trucks	2270002051	175 < hp ≤ 300	Diesel	0.199	1.031	2.611	0.051	0.214	536.207
Drum roller	130	Rollers	2270002015	100 < hp ≤ 175	Diesel	0.299	1.508	3.876	0.054	0.338	535.896
Concrete truck	250	Off-Highway Trucks	2270002051	175 < hp ≤ 300	Diesel	0.199	1.031	2.611	0.051	0.214	536.207
Backhoe/loader	90	Tractor/Loader/Backhoes	2270002066	75 < hp ≤ 100	Diesel	1.329	7.492	6.218	0.070	1.135	691.842
Post Driver	130	Other Construction Equipment	2270002081	100 < hp ≤ 175	Diesel	0.327	1.646	4.260	0.054	0.350	535.806
Crane	275	Cranes	2270002045	175 < hp ≤ 300	Diesel	0.258	0.789	3.710	0.052	0.178	530.236
Grade-all	100	Graders	2270002048	75 < hp ≤ 100	Diesel	0.353	3.881	4.170	0.060	0.522	595.053
Flat Bed Truck	220	Off-Highway Trucks	2270002051	175 < hp ≤ 300	Diesel	0.199	1.031	2.611	0.051	0.214	536.207
Trencher	250	Trenchers	2270002030	175 < hp ≤ 300	Diesel	0.294	1.340	4.024	0.053	0.268	535.911
Lightweight Truck	150	Other Construction Equipment	2265002081	100 < hp ≤ 175	Gasoline	0.594	20.778	1.749	0.013	0.071	784.580
Gator/Mule ATV	30	Speciality Vehicles/Carts	2265001060	25 < hp ≤ 40	Gasoline	4.859	107.338	9.158	0.015	0.068	803.267
Drilling Rig for Water Wells	565	Bore/Drilling Rigs	2270002033	300 < hp ≤ 600	Diesel	0.392	1.860	5.768	0.053	0.303	529.819
Drilling Rig Air Compressor	500	Air Compressors	2270006015	300 < hp ≤ 600	Diesel	0.314	1.522	4.903	0.053	0.248	530.060
Welding machines	25	Welders	2270006025	16 < hp ≤ 25	Diesel	2.024	8.181	6.634	0.070	1.161	689.691
Forklifts	125	Rough Terrain Forklifts	2270002057	100 < hp ≤ 175	Diesel	0.315	1.581	4.095	0.054	0.343	535.845
Crawler tractor	84	Crawler Tractor/Dozers	2270002069	75 < hp ≤ 100	Diesel	0.358	3.884	4.193	0.060	0.524	595.039
Jackhammer/ Skid Steer loader	81	Skid Steer Loaders	2270002072	75 < hp ≤ 100	Diesel	1.614	8.144	6.667	0.070	1.257	690.940
Bucket trucks	210	Off-Highway Trucks	2270002051	175 < hp ≤ 300	Diesel	0.199	1.031	2.611	0.051	0.214	536.207
Bullwheel tensioner truck	165	Off-Highway Trucks	2270002051	100 < hp ≤ 175	Diesel	0.224	1.447	2.942	0.054	0.356	536.130
Drum puller truck	460	Off-Highway Trucks	2270002051	300 < hp ≤ 600	Diesel	0.173	1.273	3.007	0.052	0.208	536.288
Pump truck	350	Off-Highway Trucks	2270002051	300 < hp ≤ 600	Diesel	0.173	1.273	3.007	0.052	0.208	536.288
Auger truck	200	Off-Highway Trucks	2270002051	175 < hp ≤ 300	Diesel	0.199	1.031	2.611	0.051	0.214	536.207
Water truck	220	Off-Highway Trucks	2270002051	175 < hp ≤ 300	Diesel	0.199	1.031	2.611	0.051	0.214	536.207

Notes:

1. Emission factors calculated using EPA's NONROAD emission model.
2. Emission factors for equipment fleet in use in Calendar Year 2011.

Table A6

Emissions from Diesel Non-Road Construction Equipment - Section 1

NextLight SilverState Solar Project

Equipment Type	No. of Units	Equipment Engine Size (hp)	Load	Fuel Type	Estimated Average Daily Usage (hrs/day)	Average Criteria Pollutant Daily Emissions (lbs/day)					Average GHG Daily Emissions (lbs/day)	Total Work Days per Unit	Criteria Pollutant Total Emissions (tons)					GHG Total Emissions (metric tons)
						VOC	CO	NO_x	SO_2	PM	CO_2		VOC	CO	NO_x	SO_2	PM	CO_2
Scraper	4	300	59%	Diesel	7	2.7	12	36	0.57	2.5	5,857	85	0.11	0.51	1.51	0.02	0.11	226
Tractor	5	300	59%	Diesel	7	3.3	15	44	0.71	3.1	7,321	85	0.14	0.64	1.87	0.03	0.13	282
Motor grader	4	200	59%	Diesel	7	1.7	8	23	0.38	1.6	3,905	85	0.07	0.34	0.99	0.02	0.07	151
Excavator	4	195	59%	Diesel	7	1.6	7.7	22	0.37	1.57	3,807	85	0.07	0.33	0.92	0.016	0.07	147
Dozer	2	300	59%	Diesel	7	1.3	6.0	18	0.28	1.2	2,929	85	0.06	0.26	0.75	0.012	0.05	113
Dump truck	10	275	59%	Diesel	7	5.0	26	65	1.3	5.4	13,426	85	0.21	1.10	2.78	0.05	0.23	518
Drum roller	5	130	59%	Diesel	7	1.8	9	23	0.32	2.0	3,172	85	0.08	0.38	0.97	0.01	0.09	122
Concrete truck	2	250	59%	Diesel	2.5	0.3	1.7	4	0.08	0.35	872	20	0.00	0.02	0.04	0.001	0.003	8
Backhoe/loader	10	90	21%	Diesel	7	3.9	22	18	0.20	3.3	2,018	126	0.24	1.38	1.14	0.013	0.21	115
Post Driver	8	130	43%	Diesel	6	1.9	10	25	0.32	2.1	3,169	115	0.11	0.56	1.45	0.02	0.12	165
Crane	1	275	43%	Diesel	4	0.3	0.8	4	0.05	0.2	553	66	0.01	0.03	0.13	0.00	0.01	17
Grade-all	2	100	59%	Diesel	7	0.6	7.1	7.6	0.11	1.0	1,084	85	0.03	0.30	0.32	0.005	0.04	42
Flat Bed Truck	5	220	59%	Diesel	3	0.9	4	11	0.22	0.9	2,302	189	0.08	0.42	1.06	0.02	0.09	197
Trencher	3	250	59%	Diesel	7	2.0	9.2	27	0.36	1.8	3,660	126	0.13	0.58	1.73	0.02	0.12	209
Drilling Rig for Water Wells	2	565	43%	Diesel	6	2.5	12	37	0.34	1.9	3,405	20	0.03	0.12	0.37	0.003	0.02	31
Drilling Rig Air Compressor	2	500	43%	Diesel	6	1.8	8.7	28	0.30	1.4	3,015	20	0.02	0.09	0.28	0.003	0.014	27
Welding machines	1	25	21%	Diesel	6	0.1	0.6	0.5	0.005	0.08	48	40	0.003	0.011	0.009	0.0001	0.002	0.9
Forklifts	16	125	59%	Diesel	4	3.3	16	43	0.56	3.6	5,576	40	0.07	0.33	0.85	0.011	0.07	101
Crawler tractor	1	84	59%	Diesel	6	0.2	2.5	2.7	0.04	0.34	390	40	0.005	0.05	0.05	0.0008	0.007	7
Jackhammer/ Skid Steer loader	10	81	21%	Diesel	5	3.0	15	13	0.13	2.36	1,296	40	0.061	0.31	0.25	0.0026	0.047	24
Bucket trucks	3	210	59%	Diesel	5	0.8	4.2	11	0.21	0.9	2,197	20	0.008	0.04	0.11	0.002	0.009	20
Bullwheel tensioner truck	2	165	59%	Diesel	6	0.6	3.7	7.6	0.14	0.92	1,381	20	0.006	0.04	0.08	0.001	0.009	13
Drum puller truck	2	460	59%	Diesel	6	1.2	9.1	22	0.37	1.5	3,850	20	0.012	0.09	0.22	0.004	0.015	35
Pump truck	1	350	59%	Diesel	6	0.5	3.5	8.2	0.14	0.57	1,465	7	0.002	0.01	0.03	0.0005	0.002	5
Auger truck	2	200	59%	Diesel	6	0.6	3.2	8.2	0.16	0.67	1,674	10	0.003	0.02	0.04	0.0008	0.003	8
Water truck	6	220	59%	Diesel	8.5	2.9	15	38	0.74	3.1	7,825	252	0.37	1.90	4.80	0.09	0.39	894
TOTAL						**45**	**233**	**546**	**8.4**	**44**	**86,195**	**-**	**1.9**	**10**	**23**	**0.37**	**1.9**	**3,477**

Table A7

Emissions from Diesel Non-Road Construction Equipment - Sections 2 and 3

NextLight SilverState Solar Project

Equipment Type	No. of Units	Equipment Engine Size (hp)	Load	Fuel Type	Estimated Average Daily Usage (hrs/day)	Average Criteria Pollutant Daily Emissions (lbs/day)					Average GHG Daily Emissions (lbs/day)	Total Work Days per Unit	Criteria Pollutant Total Emissions (tons)					GHG Total Emissions (metric tons)
						VOC	CO	NO_x	SO_2	PM	CO_2		VOC	CO	NO_x	SO_2	PM	CO_2
Scraper	4	300	59%	Diesel	7	2.7	12	36	0.57	2.5	5,857	315	0.42	1.9	5.6	0.09	0.39	837
Tractor	5	300	59%	Diesel	7	3.3	15	44	0.71	3.1	7,321	315	0.52	2.4	6.9	0.11	0.48	1,046
Motor grader	4	200	59%	Diesel	7	1.7	8.0	23	0.38	1.6	3,905	315	0.27	1.3	3.7	0.06	0.26	558
Excavator	4	195	59%	Diesel	7	1.6	7.7	22	0.37	1.6	3,807	315	0.26	1.21	3.4	0.06	0.25	544
Dozer	2	300	59%	Diesel	7	1.3	6.0	18	0.28	1.2	2,929	315	0.21	0.95	2.8	0.04	0.19	418
Dump truck	10	275	59%	Diesel	7	5.0	26	65	1.28	5.4	13,426	315	0.78	4.1	10	0.20	0.84	1,918
Drum roller	5	130	59%	Diesel	7	1.8	9	23	0.32	2.0	3,172	315	0.28	1.4	3.6	0.05	0.32	453
Concrete truck	2	250	59%	Diesel	2.5	0.3	1.7	4	0.08	0.3	872	150	0.02	0.13	0.32	0.006	0.03	59
Backhoe/loader	10	90	21%	Diesel	7	3.9	22	18	0.20	3.3	2,018	378	0.73	4.1	3.4	0.04	0.63	346
Post Driver	8	130	43%	Diesel	6	1.9	10	25	0.32	2.1	3,169	210	0.20	1.0	2.6	0.03	0.22	302
Crane	1	275	43%	Diesel	4	0.3	0.8	4	0.05	0.2	553	236	0.03	0.1	0.5	0.01	0.02	59
Grade-all	2	100	59%	Diesel	7	0.6	7.1	7.6	0.11	1.0	1,084	315	0.10	1.1	1.2	0.02	0.15	155
Flat Bed Truck	5	220	59%	Diesel	5	1.4	7	19	0.36	1.5	3,836	378	0.27	1.4	3.5	0.07	0.29	658
Trencher	3	250	59%	Diesel	7	2.0	9.2	27	0.36	1.8	3,660	378	0.38	1.7	5.2	0.07	0.35	627
Drilling Rig for Water Wells	0	565	43%	Diesel	0	0	0	0	0	0	0	0	0	0	0.0	0	0	0
Drilling Rig Air Compressor	0	500	43%	Diesel	0	0	0	0	0	0	0	0	0	0	0.0	0	0	0
Welding machines	1	25	21%	Diesel	6	0.14	0.6	0.5	0.005	0.08	48	310	0.02	0.09	0.07	0.0008	0.012	7
Forklifts	16	125	59%	Diesel	4	3.3	16	43	0.56	3.6	5,576	310	0.51	2.5	6.6	0.09	0.55	784
Crawler tractor	1	84	59%	Diesel	6	0.2	2.5	2.7	0.04	0.34	390	310	0.04	0.39	0.4	0.006	0.05	55
Jackhammer/ Skid Steer loader	10	81	21%	Diesel	5	3.0	15	13	0.13	2.36	1,296	310	0.47	2.37	1.94	0.020	0.37	182
Bucket trucks	3	210	59%	Diesel	5	0.8	4.2	11	0.21	0.9	2,197	160	0.07	0.34	0.9	0.02	0.07	159
Bullwheel tensioner truck	2	165	59%	Diesel	6	0.6	3.7	7.6	0.14	0.92	1,381	160	0.05	0.30	0.6	0.011	0.07	100
Drum puller truck	2	460	59%	Diesel	6	1.2	9.1	22	0.37	1.5	3,850	160	0.10	0.73	1.7	0.03	0.12	279
Pump truck	1	350	59%	Diesel	6	0.5	3.5	8.2	0.14	0.57	1,465	20	0.005	0.03	0.08	0.001	0.006	13
Auger truck	2	200	59%	Diesel	6	0.6	3.2	8.2	0.16	0.67	1,674	50	0.02	0.08	0.2	0.004	0.02	38
Water truck	6	220	59%	Diesel	8.5	2.9	15	38	0.74	3.1	7,825	756	1.10	5.7	14.4	0.28	1.18	2,683
TOTAL						**41**	**215**	**488**	**7.9**	**42**	**81,309**	**-**	**7**	**35**	**80**	**1.3**	**6.9**	**12,283**

Table A8
On-Road Construction Vehicle Usage
NextLight SilverState Solar Project

Section 1

Vehicle Type	Vehicle Description	Average Number of Vehicles per day	Total Working Days	Total Daily VMT per Unit (VMT/day)			Total Daily VMT All Units (VMT/day)			Total Overall VMT of All Units (VMT)		
				Unpaved Roads	Paved Roads	TOTAL	Unpaved Roads	Paved Roads	TOTAL	Unpaved Roads	Paved Roads	TOTAL
Heavy Heavy Duty Diesel Truck	Dump Trucks / Concrete Trucks	15	201	1	70	71	15	1,050	1,065	3,015	211,050	214,065
Diesel Delivery Trucks	Delivery Trucks	5	201	1	70	71	5	350	355	1,005	70,350	71,355
Light-Duty Gasoline Vehicles	Lightweight Truck[1]	40	201	16	70	86	640	2,800	3,440	128,640	562,800	691,440
	Worker Commute Vehicles	230	201	1	70	71	230	16,100	16,330	46,230	3,236,100	3,282,330
	Subtotal	-	-	-	-	-	*870*	*18,900*	*19,770*	*174,870*	*3,798,900*	*3,973,770*
Gasoline ATVs	Gator/Mule ATVs[2]	40	132	20	0	20	800	0	800	105,600	0	105,600
Total							**1,690**	**20,300**	**21,990**	**284,490**	**4,080,300**	**4,364,790**

Notes:

1. Daily VMT estimated based travel of 1 mile on entrance road and an average of 5 miles travelled per hour on site roads for 3 hours of work each day.
2. Daily VMT estimated based on an average of 5 miles travelled per hour for 4 hours of work each day.

Sections 2 and 3

Vehicle Type	Vehicle Description	Average Number of Vehicles per day	Total Working Days	Total Daily VMT per Unit (VMT/day)			Total Daily VMT All Units (VMT/day)			Total Overall VMT of All Units (VMT)		
				Unpaved Roads	Paved Roads	TOTAL	Unpaved Roads	Paved Roads	TOTAL	Unpaved Roads	Paved Roads	TOTAL
Heavy Heavy Duty Diesel Truck	Dump Truck / Delivery Trucks	15	502	1	70	71	15	1,050	1,065	7,530	527,100	534,630
Diesel Delivery Trucks	Delivery Trucks	5	502	1	70	71	5	350	355	2,510	175,700	178,210
Light-Duty Gasoline Vehicles	Lightweight Truck[1]	40	502	16	70	86	640	2,800	3,440	321,280	1,405,600	1,726,880
	Worker Commute Vehicles	230	502	1	70	71	230	16,100	16,330	115,460	8,082,200	8,197,660
	Subtotal	-	-	-	-	-	*870*	*18,900*	*19,770*	*436,740*	*9,487,800*	*9,924,540*
Gasoline ATVs	Gator/Mule ATVs[2]	40	396	20	0	20	800	0	800	316,800	0	316,800
Total							**1,690**	**20,300**	**21,990**	**763,580**	**10,190,600**	**10,954,180**

Notes:

1. Daily VMT estimated based travel of 1 mile on entrance road and an average of 5 miles travelled per hour on site roads for 3 hours of work each day.
2. Daily VMT estimated based on an average of 5 miles travelled per hour for 4 hours of work each day.

Table A9

On-Road Construction Vehicle Exhaust Emission Factors

NextLight SilverState Solar Project

Scenario Year	Equipment Type	Emission Factor[1,2,3] (lb/VMT)							
		VOC	CO	NO_x	SO_2	PM_{10}	$PM_{2.5}$	CO_2	CH_4
2011	Heavy Heavy Duty Diesel Trucks	0.00279543	0.01112463	0.03455809	0.00003972	0.00166087	0.00144489	4.2204568	0.0001291
	Diesel Delivery Trucks	0.00241868	0.01693242	0.01833660	0.00002728	0.00070097	0.00059682	2.75180822	0.00011655
	Light-Duty Gasoline Vehicles	0.00085233	0.00826276	0.00084460	0.00001077	0.00008879	0.00005653	1.10235154	0.00007678
	Gasoline ATVs	0.00422839	0.08750441	0.00111552	0.00000881	0.00014550	0.00014550	0.51698633	-
2012	Heavy Heavy Duty Diesel Trucks	0.00252764	0.01021519	0.03092379	0.00004042	0.00149566	0.00129354	4.21590774	0.00011651
	Diesel Delivery Trucks	0.00223776	0.01545741	0.01732423	0.00002667	0.00064975	0.00054954	2.76628414	0.00010668
	Light-Duty Gasoline Vehicles	0.00079628	0.00765475	0.00077583	0.00001073	0.00008979	0.0000575	1.1015254	0.00007169
	Gasoline ATVs	0.00422839	0.08750441	0.00111552	0.00000881	0.00014550	0.00014550	0.51698633	-

Notes:

1. Heavy Heavy Duty Diesel Truck Emission Factors based on "Highest (Most Conservative_ EMFAC2007 (version 2.3) Emission Factors for On-Road Heavy-Heavy-Duty Diesel Trucks" (South Coast Air Quality Management District 2010).

2. Delivery Truck and Passenger Vehicle Emission Factors based on "Highest (Most Conservative_ EMFAC2007 (version 2.3) Emission Factors for On-Road Passenger Vehicles & Delivery Trucks" (South Coast Air Quality Management District2010).

3. ATV emission factors calculated using EPA's NONROAD emission model. Emission factors for equipment fleet in use in Calendar Year 2011.

Table A10
Exhaust Emissions from On-Road Construction Vehicles
NextLight SilverState Solar Project

Section 1

Vehicle Type	Average Daily Miles Travelled (VMT/day)	Total Criteria Pollutant Emissions (lbs/day)						Total Miles Travelled (VMT)	Total Criteria Pollutant Emissions (tons)						Total GHG Emissions (metric tons)	
		VOC	CO	NO_x	SO_2	PM_{10}	$PM_{2.5}$		VOC	CO	NO_x	SO_2	PM_{10}	$PM_{2.5}$	CO_2	CH_4
Heavy Heavy Duty Diesel Trucks	1,065	3.0	12	37	0.042	1.8	1.5	214,065	0.30	1.2	3.7	0.0043	0.18	0.15	410	0.013
Diesel Delivery Trucks	355	0.9	6.0	6.5	0.010	0.25	0.21	71,355	0.1	0.6	0.65	0.0010	0.025	0.021	89	0.004
Light-Duty Gasoline Vehicles	19,770	17	163	17	0.21	1.8	1.1	3,973,770	1.7	16	1.7	0.021	0.18	0.11	1,987	0.14
Gasoline ATVs	800	3.4	70	0.89	0.0070	0.12	0.12	105,600	0.2	4.6	0.059	0.0005	0.0077	0.0077	25	-
Total	-	**24**	**251**	**61**	**0.27**	**3.9**	**3.0**	-	**2.3**	**23**	**6.1**	**0.027**	**0.39**	**0.30**	**2,511**	**0.2**

Sections 2/3

Vehicle Type	Average Daily Miles Travelled (VMT/day)	Total Criteria Pollutant Emissions (lbs/day)						Total Miles Travelled (VMT)	Total Criteria Pollutant Emissions (tons)						Total GHG Emissions (metric tons)	
		VOC	CO	NO_x	SO_2	PM_{10}	$PM_{2.5}$		VOC	CO	NO_x	SO_2	PM_{10}	$PM_{2.5}$	CO_2	CH_4
Heavy Heavy Duty Diesel Trucks	1,065	2.7	11	33	0.043	1.6	1.4	534,630	0.68	2.7	8.3	0.011	0.40	0.35	1,022	0.03
Diesel Delivery Trucks	355	0.8	5.5	6.2	0.009	0.23	0.20	178,210	0.20	1.4	1.5	0.002	0.06	0.05	224	0.009
Light-Duty Gasoline Vehicles	19,770	16	151	15	0.21	1.8	1.1	9,924,540	4.0	38	3.8	0.053	0.45	0.29	4,959	0.32
Gasoline ATVs	800	3.4	70	0.89	0.007	0.12	0.12	316,800	0.7	14	0.18	0.001	0.023	0.023	74	-
Total	-	**23**	**238**	55	**0.27**	**3.7**	**2.8**	-	5.5	**56**	**14**	**0.068**	**0.93**	**0.70**	**6,279**	**0.4**

Table A11
Fugitive Dust Emission Factors - Roads

Unpaved Roads - Emission Factor Derivation

$E = k(s/12)^a(W/3)^b$ AP-42 Section 13.2.2 (11/06 version)

where:

E = particulate emission factor (lb/VMT)
k, a, b = empirical constants for industrial roads
s = surface material silt content (%)
W = average vehicle weight (tons)

Parameter	Units	PM_{10}	$PM_{2.5}$	Reference
Mean Vehicle Weight	**tons**	4.1	4.1	Assumption
Constant, k	lb/VMT	1.5	0.15	Table 13.2.2-2 (worst case)
Constant, a		0.9	0.9	Table 13.2.2-2 (worst case)
Constant, b		0.45	0.45	Table 13.2.2-2 (worst case)
Silt content, s	%	8.5	8.5	Table 13.2..2-1 (construction sites)
Uncontrolled Emission factor, E	**lb/VMT**	**1.27**	**0.127**	**Calculation**
Control Efficiency for Watering	%	0.65	0.65	Assumption
Controlled Emission factor, E	**lb/VMT**	**0.44**	**0.044**	**Calculation**

Notes:

1. Mean vehicle weight estimated based on average daily use on site roads (15 heavy-duty diesel trucks, 5 diesel delivery trucks, 40 light-duty gasoline trucks, and 40 ATVs).

Paved Roads - Emission Factor Derivation Table

$E = (k(sL/2)^{0.65}(W/3)^{1.5}-C)$ AP-42 Section 13.2.1 (11/06 version)

where:

E = particulate emission factor (lb/VMT)
k = particle size multiplier
sL = road surface silt loading (g/m^2)
W = average vehicle weight (tons)
C = emission factor for 1980's vehicle fleet exhaust, break wear and tire wear

Parameter	Units	PM_{10}	$PM_{2.5}$	Reference
Mean Vehicle Weight	tons	4.4	4.4	Assumption
k factor	lb/VMT	0.016	0.0024	Table 13.2-1.1
Silt Loading, sL	g/m^2	0.06	0.06	Table 13.2.1-3
Emission factor, C	lb/VMT	0.00047	0.00036	Table 13.2.1-2
Uncontrolled Emission factor, E	**lb/VMT**	**0.0024**	**0.00008**	**Calculation**

Notes:

1. Mean vehicle weight based on average traffic on Interstate 15 = 20% heavy-duty diesel trucks and 80% light-duty gasoline vehicles/trucks.

Table A12

Fugitive Dust Emissions from On-Road Construction Vehicle Travel on On-Site and Off-Site Roads

NextLight SilverState Solar Project

Section 1

Paved Roads						Unpaved Roads						All Roads			
Average Daily Miles Travelled (VMT/day)	Total Miles Travelled on Paved Roads (VMT)	Average Daily Fugitive Dust Emissions (lbs/day)		Total Fugitive Dust Emissions (tons)		Average Daily Miles Travelled (VMT/day)	Total Miles Travelled on Unpaved Roads (VMT)	Average Daily Fugitive Dust Emissions (lbs/day)		Total Fugitive Dust Emissions (tons)		Average Daily Fugitive Dust Emissions (lbs/day)		Total Fugitive Dust Emissions from Roads (tons)	
		PM_{10}	$PM_{2.5}$	PM_{10}	$PM_{2.5}$			PM_{10}	$PM_{2.5}$	PM_{10}	$PM_{2.5}$	PM_{10}	$PM_{2.5}$	PM_{10}	$PM_{2.5}$
20,300	4,080,300	50	1.5	5.0	0.16	1,690	284,490	749	75	63	6.3	798	76	68	6.5

Sections 2/3

Paved Roads						Unpaved Roads						All Roads			
Average Daily Miles Travelled (VMT/day)	Total Miles Travelled on Paved Roads (VMT)	Average Daily Fugitive Dust Emissions (lbs/day)		Total Fugitive Dust Emissions (tons)		Average Daily Miles Travelled (VMT/day)	Total Miles Travelled on Unpaved Roads (VMT)	Average Daily Fugitive Dust Emissions (lbs/day)		Total Fugitive Dust Emissions (tons)		Average Daily Fugitive Dust Emissions (lbs/day)		Total Fugitive Dust Emissions from Roads (tons)	
		PM_{10}	$PM_{2.5}$	PM_{10}	$PM_{2.5}$			PM_{10}	$PM_{2.5}$	PM_{10}	$PM_{2.5}$	PM_{10}	$PM_{2.5}$	PM_{10}	$PM_{2.5}$
20,300	10,190,600	50	1.5	12.4	0.39	1,690	763,580	749	75	169	16.9	798	76	182	17.3

Table A13
Fugitve Dust Emissions from On-Site Construction Activities - Section 1
NextLight SilverState Solar Project

Activity	Daily Construction Use		Duration of Activity	Emission Factor[1]			Average Daily Emissions (lbs/day)		Total Emissions (tons)	
	Value	Units	(days)	PM_{10}	$PM_{2.5}$	Units	PM_{10}	$PM_{2.5}$	PM_{10}	$PM_{2.5}$
Bulldozing[2]	14	hr/day	85	2.46	1.11	lb/hr	34	16	1.5	0.7
Grading[3]	700	VMT/day	85	1.071	0.137	lb/VMT	750	96	32	4.1
Total							**784**	**112**	**33**	**4.7**

Notes:
1. See emission factor derivations below.
2. Daily construction use of 14 hrs/day based on 2 dozers operating 7 hrs/day.
3. Daily construction use of 700 VMT/day based on on 10 scrapers/motor graders/grade-alls operating for 7 hours/day at 10 miles per hour.

Bulldozing and Grading Emission Factor Derivation

Activity	Emission Factor Units	Uncontrolled Emission Factor		Controlled Emission Factor[1]	
		PM_{10}	$PM_{2.5}$	PM_{10}	$PM_{2.5}$
Bulldozing[2]	lb/hr	7.04	3.17	2.464	1.110
Grading[6]	lb/VMT	3.06	0.392	1.071	0.137

Notes:
1. Assume 65% dust control factor based on as-needed watering.
2. Emission factors from AP-42 Section 11.9, Table 11.9-1 (Bulldozing-Overburden). Assume silt content of 8.5% and moisture content of 2%.
3. Emission factors from AP-42 Section 11.9, Table 11.9-1 (Grading). Assume vehicle speed of 10 miles per hour.

Table A14
Fugitve Dust Emissions from On-Site Construction Activities - Sections 2 and 3
NextLight SilverState Solar Project

Activity	Daily Construction Use		Duration of Activity	Emission Factor[1]			Average Daily Emissions (lbs/day)		Total Emissions (tons)	
	Value	Units	(days)	PM_{10}	$PM_{2.5}$	Units	PM_{10}	$PM_{2.5}$	PM_{10}	$PM_{2.5}$
Bulldozing[2]	14	hr/day	315	2.46	1.11	lb/hr	34	16	5.4	2.4
Grading[3]	700	VMT/day	315	1.071	0.137	lb/VMT	750	96	118	15
Total							**784**	**112**	**124**	**18**

Notes:

1. See emission factor derivations below.
2. Daily construction use of 14 hrs/day based on 2 dozers operating 7 hrs/day.
3. Daily construction use of 700 VMT/day based on on 10 scrapers/motor graders/grade-alls operating for 7 hours/day at 10 miles per hour.

Bulldozing and Grading Emission Factor Derivation

Activity	Emission Factor Units	Uncontrolled Emission Factor		Controlled Emission Factor[1]	
		PM_{10}	$PM_{2.5}$	PM_{10}	$PM_{2.5}$
Bulldozing[2]	lb/hr	7.04	3.17	2.464	1.110
Grading[6]	lb/VMT	3.06	0.392	1.071	0.137

Notes:

1. Assume 65% dust control factor based on as-needed watering.
2. Emission factors from AP-42 Section 11.9, Table 11.9-1 (Bulldozing-Overburden). Assume silt content of 8.5% and moisture content of 2%.
3. Emission factors from AP-42 Section 11.9, Table 11.9-1 (Grading). Assume vehicle speed of 10 miles per hour.

Emission Calculations for Operational Activities
NextLight SilverState Solar Project

Table No.	Table Description
Table B1	Summary of Operational Emissions
Table B2	Comparision of Yearly Operational Emissions to General Conformity De Minimis Thresholds
Table B3	Emissions for Stationary Diesel Fire Pump
Table B4	Emission Factors for Diesel Non-Road Equipment for Operations
Table B5	Emissions from Diesel Non-Road Equipment for Opeartions
Table B6	On-Road and ATV Vehicle Usage for Operations
Table B7	On-Road Vehicle Exhaust Emission Factors
Table B8	Exhaust Emissions from On-Road Vehicles for Operations
Table B9	Fugitive Dust Emission Factors - Roads
Table B10	Fugitive Dust Emissions from On-Road Vehicle Travel on On-Site and Off-Site Roads During Operations
Table B11	Emissions of SF6 from Electrical Equipment Leaks

Table B1
Summary of Operational Emissions
NextLight SilverState Solar Project

Emission Source	Total Criteria Pollutant Emissions (tons/yr)						GHG Total Emissions (metric tons/yr)			
	VOC	CO	NO_x	SO_2	PM_{10}	$PM_{2.5}$	CO_2	CH_4	SF_6	CO_2-e[1]
Combustion Emissions: Stationary Emergency Fire Pump	0.0026	0.032	0.026	0.0080	0.0019	0.0019	4.1	-	-	4.1
Combustion Emissions: Non-Road Equipment	0.022	0.11	0.29	0.0044	0.023	0.023	40	-	-	40
Combustion Emissions: On-Road Vehicles and ATVs	0.071	0.91	0.098	0.001	0.007	0.006	60	0.0038	-	60
Fugitive Dust	-	-	-	-	2.1	0.20	-	-	-	-
SF_6 Leakage from Equipment	-	-	-	-	-	-	-	-	0.0013	30
Total	**0.095**	**1.0**	**0.41**	**0.013**	**2.1**	**0.23**	**104**	**0.0038**	**0.0013**	**134**

Notes:

1. CO_2 equivalents (CO_2-e)calculated by mutliplying CO_2 emissions by a global warming potential (GWP) of 1, CH_4 emissions by a GWP of 21, and SF_6 emissions by a GWP of 23,000.

Table B2
Comparision of Yearly Operational Emissions to General Conformity De Minimis Thresholds
NextLight SilverState Solar Project

Hydrographic Area	Emissions (tons/yr)			
	VOC	CO	NO_x	PM_{10}
164A and 164B	0.065	0.77	0.35	2.1

Hydrographic Area	Emissions (tons/yr)			
	VOC	CO	NO_x	PM_{10}
165	0.0065	0.060	0.013	0.018

CO and PM_{10} Nonattainment Area

Hydrographic Area	Emissions (tons/yr)			
	VOC	CO	NO_x	PM_{10}
212	0.024	0.22	0.048	0.066
General Conformity De Minimis Threshold	**-**	**100**	**-**	**70**

Ozone Nonattainment Area

Hydrographic Area	Emissions (tons/yr)			
	VOC	CO	NO_x	PM_{10}
All Areas	0.095	1.0	0.41	2.1
General Conformity De Minimis Threshold	**100**	**-**	**100**	**-**

Table B3
Emissions for Stationary Diesel Fire Pump
NextLight SilverState Solar Project

Parameter	Value	Units
Power Rating	150	hp
Yearly Maintenance Operation (1 hr per week)	52	hr/yr

Pollutant	Emission Factor[1] (lb/hp-hr)	Emission Factor[2] (g/hp-hr)	Maximum Hourly Emission Rate (lb/hr)	Annual Emissions (tons per year)	GHG Annual Emissions (metric tons per year)
NO_x	-	3.0	1.0	0.026	-
CO	-	3.7	1.2	0.032	-
VOC	-	0.3	0.10	0.0026	-
PM_{10}	-	0.22	0.073	0.0019	-
$PM_{2.5}$	-	0.22	0.073	0.0019	-
SO_2	0.00205	-	0.31	0.0080	-
CO_2	1.15	-	173	-	4.1

Notes:
1. Emission factors from United States Environmental Protection Agency (EPA). 1996. AP 42 Fifth Edition, Volume I - Section 3.3 - Gasoline and Diesel Industrial Engines.
2. Emission factors for diesel emergency fire pumps in NSPS Subpart IIII. VOC emission factor assumed to represent 10% of VOC/NOx emission standard listed in this regulation.

Table B4
Emission Factors for Diesel Non-Road Equipment for Operations
NextLight SilverState Solar Project

Construction Equipment Assumptions		Emission Factor Data[1]									
						Emission Factor[2] (g/hp-hr)					
Equipment Type	Equipment Engine Size (hp)	Equipment Used for Emission Factor	SCC	Equipment Size Range	Fuel Type	VOC	CO	NO_x	SO_2	PM	CO_2
Tractor	300	Crawler Tractor/Dozers	2270002069	175 < hp ≤ 300	Diesel	0.241	1.099	3.228	0.052	0.225	536.075
Forklifts	125	Rough Terrain Forklifts	2270002057	100 < hp ≤ 175	Diesel	0.315	1.581	4.095	0.054	0.343	535.845
Water truck	220	Off-Highway Trucks	2270002051	175 < hp ≤ 300	Diesel	0.199	1.031	2.611	0.051	0.214	536.207
Bucket Truck	220	Off-Highway Trucks	2270002051	175 < hp ≤ 300	Diesel	0.199	1.031	2.611	0.051	0.214	536.207
Weed Abatement Truck	220	Off-Highway Trucks	2270002051	175 < hp ≤ 300	Diesel	0.199	1.031	2.611	0.051	0.214	536.207

Notes:
1. Emission factors calculated using EPA's NONROAD emission model.
2. Emission factors for equipment fleet in use in Calendar Year 2011.

Table B5

Emissions from Diesel Non-Road Equipment for Opeartions

NextLight SilverState Solar Project

Equipment Type	No. of Units	Equipment Engine Size (hp)	Load	Fuel Type	Estimated Average Daily Usage (hrs/day)	Total Work Days per Unit	Criteria Pollutant Total Emissions (tons/yr)					GHG Total Emissions (metric tons)
							VOC	CO	NO_x	SO_2	PM	CO_2
Tractor	1	300	59%	Diesel	1	80	0.004	0.017	0.050	0.0008	0.0035	7.6
Forklifts	1	125	59%	Diesel	2	260	0.013	0.067	0.17	0.0023	0.014	21
Water truck	1	220	59%	Diesel	1	80	0.0023	0.012	0.030	0.0006	0.0024	5.6
Bucket Truck	1	220	59%	Diesel	8	2	0.0005	0.002	0.006	0.0001	0.0005	1.1
Weed Abatement Truck	1	220	59%	Diesel	1	80	0.0023	0.012	0.030	0.0006	0.0024	5.6
TOTAL						-	**0.022**	**0.11**	**0.29**	**0.0044**	**0.023**	**40**

Table B6
On-Road and ATV Vehicle Usage for Operations
NextLight SilverState Solar Project

Vehicle Type	Vehicle Description	Average Number of Vehicles per day	Total Working Days	Total Daily VMT per Unit (VMT/day)			Total Daily VMT All Units (VMT/day)			Total Overall VMT of All Units (VMT/yr)		
				Unpaved Roads	Paved Roads	TOTAL	Unpaved Roads	Paved Roads	TOTAL	Unpaved Roads	Paved Roads	TOTAL
Heavy Heavy Duty Diesel Truck	Dump Truck / Delivery Trucks	1	26	1	70	71	1	70	71	26	1,820	1,846
Diesel Delivery Trucks	Diesel Delivery Trucks	1	26	1	70	71	1	70	71	26	1,820	1,846
Light-Duty Gasoline Vehicles	Lightweight Trucks[1]	2	260	21	70	91	42	140	182	10,920	36,400	47,320
	Worker Commute Vehicles	3	260	1	70	71	3	210	213	780	54,600	55,380
	Subtotal	-	-	-	-	-	*45*	*350*	*395*	*11,700*	*91,000*	*102,700*
Gasoline ATVs	Gator/Mule ATVs[2]	2	260	20	0	20	40	0	40	10,400	0	10,400
Total							-	-	-	**11,726**	**92,820**	**104,546**

Notes:

1. Daily VMT estimated based travel of 1 mile on entrance road and an average of 5 miles travelled per hour on site roads for 4 hours of work each day.
2. Daily VMT estimated based on an average of 5 miles travelled per hour for 4 hours of work each day.

Table B7
On-Road Vehicle Exhaust Emission Factors
NextLight SilverState Solar Project

Scenario Year	Equipment Type	Emission Factor[1,2,3] (lb/VMT)							
		VOC	CO	NO_x	SO_2	PM_{10}	$PM_{2.5}$	CO_2	CH_4
2011	Heavy Heavy Duty Diesel Trucks	0.00279543	0.01112463	0.03455809	0.00003972	0.00166087	0.00144489	4.2204568	0.0001291
	Diesel Delivery Trucks	0.00241868	0.01693242	0.0183366	0.00002728	0.00070097	0.00059682	2.75180822	0.00011655
	Light-Duty Gasoline Vehicles	0.00085233	0.00826276	0.0008446	0.00001077	0.00008879	0.00005653	1.10235154	0.00007678
	Gasoline ATVs	0.00422839	0.08750441	0.00111552	0.00000881	0.00014550	0.00014550	0.51698633	-

Notes:

1. Heavy Heavy Duty Diesel Truck Emission Factors based on "Highest (Most Conservative_ EMFAC2007 (version 2.3) Emission Factors for On-Road Heavy-Heavy-Duty Diesel Trucks" (South Coast Air Quality Management District 2010).

2. Delivery Truck and Passenger Vehicle Emission Factors based on "Highest (Most Conservative_ EMFAC2007 (version 2.3) Emission Factors for On-Road Passenger Vehicles & Delivery Trucks" (South Coast Air Quality Management District2010).

3. ATV emission factors calculated using EPA's NONROAD emission model.

Table B8
Exhaust Emissions from On-Road Vehicles for Operations
NextLight SilverState Solar Project

Vehicle Type	Total Miles Travelled (VMT)	Total Criteria Pollutant Emissions (tons/yr)						Total GHG Emissions (metric tons)	
		VOC	CO	NO_x	SO_2	PM_{10}	$PM_{2.5}$	CO_2	CH_4
Heavy Heavy Duty Diesel Trucks	1,846	0.003	0.010	0.032	0.00004	0.0015	0.0013	3.5	0.00011
Diesel Delivery Trucks	1,846	0.002	0.016	0.017	0.00003	0.0006	0.0006	2.3	0.00010
Light-Duty Gasoline Vehicles	102,700	0.044	0.42	0.043	0.00055	0.0046	0.0029	51	0.0036
Gasoline ATVs	10,400	0.022	0.46	0.006	0.00005	0.0008	0.0008	2.4	-
Total	-	**0.071**	**0.91**	**0.098**	**0.00066**	**0.0075**	**0.0055**	**60**	**0.0038**

Table B9
Fugitive Dust Emission Factors - Roads

Unpaved Site Roads - Emission Factor Derivation

$E = k(s/12)^a(W/3)^b$ AP-42 Section 13.2.2 (11/06 version)

where:

E = particulate emission factor (lb/VMT)
k, a, b = empirical constants for industrial roads
s = surface material silt content (%)
W = average vehicle weight (tons)

Parameter	Units	PM_{10}	$PM_{2.5}$	Reference
Mean Vehicle Weight	**tons**	2.3	2.3	Assumption
Constant, k	lb/VMT	1.5	0.15	Table 13.2.2-2 (worst case)
Constant, a		0.9	0.9	Table 13.2.2-2 (worst case)
Constant, b		0.45	0.45	Table 13.2.2-2 (worst case)
Silt content, s	%	8.5	8.5	Table 13.2..2-1 (construction sites)
Uncontrolled Emission factor, E	**lb/VMT**	**0.98**	**0.098**	**Calculation**
Control Efficiency for Watering	%	0.65	0.65	Assumption
Controlled Emission factor, E	**lb/VMT**	**0.34**	**0.034**	**Calculation**

Notes:

1. Mean vehicle weight estimated based on average daily use on site roads (2 ATVs and 2 light-duty gasoline trucks).

Paved Roads - Emission Factor Derivation Table

$E = (k(sL/2)^{0.65}(W/3)^{1.5}-C)$ AP-42 Section 13.2.1 (11/06 version)

where:

E = particulate emission factor (lb/VMT)
k = particle size multiplier
sL = road surface silt loading (g/m^2)
W = average vehicle weight (tons)
C = emission factor for 1980's vehicle fleet exhaust, break wear and tire wear

Parameter	Units	PM_{10}	$PM_{2.5}$	Reference
Mean Vehicle Weight	tons	4.4	4.4	Assumption
k factor	lb/VMT	0.016	0.0024	Table 13.2-1.1
Silt Loading, sL	g/m^2	0.06	0.06	Table 13.2.1-3
Emission factor, C	lb/VMT	0.00047	0.00036	Table 13.2.1-2
Uncontrolled Emission factor, E	**lb/VMT**	**0.0024**	**0.00008**	**Calculation**

Notes:

1. Mean vehicle weight based on average traffic on Interstate 15 = 20% heavy-duty diesel trucks and 80% light-duty gasoline vehicles/trucks.

Table B10
Fugitive Dust Emissions from On-Road Vehicle Travel on On-Site and Off-Site Roads During Operations
NextLight SilverState Solar Project

Paved Roads			Unpaved Site Roads			Total Fugitive Dust Emissions from Roads (tons/yr)	
Total Miles Travelled (VMT/yr)	Total Fugitive Dust Emissions (tons/yr)		Total Miles Travelled (VMT/yr)	Total Fugitive Dust Emissions (tons/yr)			
	PM_{10}	$PM_{2.5}$		PM_{10}	$PM_{2.5}$	PM_{10}	$PM_{2.5}$
92,820	0.11	0.0035	11,726	2.0	0.20	2.1	0.20

Table B11
Emissions of SF_6 from Electrical Equipment Leaks
NextLight SilverState Solar Project

Equipment Unit Description	Number of Units	SF_6 Capacity per Unit (lbs)	Total SF_6 Capacity for all Units (lbs)	Estimated Annual Leakage Rate (% per year)	Annual SF_6 Emissions	
					(pounds per year)	(metric tons per year)
230 kV Breakers	3	110	330	0.5%	1.65	0.00075
34.5 kV Breakers	6	40	240	0.5%	1.20	0.00054
Total					**2.85**	**0.0013**

Emission Calculations for Decommissioning Activities
NextLight SilverState Solar Project

Table No.	Table Description
Table C1	Summary of Decommissioning Emissions
Table C2	Comparision of Decommissioning Emissions to General Conformity De Minimis Thresholds
Table C3	Emission Factors for Diesel Non-Road Equipment for Decommissioning
Table C4	Emissions from Diesel Non-Road Equipment for Decommissioning
Table C5	On-Road Vehicle Usage for Decommissioning
Table C6	On-Road Vehicle Exhaust Emission Factors
Table C7	Exhaust Emissions from On-Road Vehicles for Decommissioning
Table C8	Fugitive Dust Emission Factors - Roads
Table C9	Fugitive Dust Emissions from On-Road Vehicle Travel on On-Site and Off-Site Roads During Decommissioning
Table C10	Fugitve Dust Emissions from On-Site Decommissioning Activities

Table C1
Summary of Decommissioning Emissions
NextLight SilverState Solar Project

Emission Source	Total Criteria Pollutant Emissions (tons)						GHG Total Emissions (metric tons)		
	VOC	CO	NO_x	SO_2	PM_{10}	$PM_{2.5}$	CO_2	CH_4	CO_2-e
Combustion Emissions: Non-Road Equipment	1.5	1.8	3.2	0.035	0.12	0.12	5,517	-	5,517
Combustion Emissions: On-Road Vehicles	0.82	7.2	1.9	0.022	0.22	0.15	2,099	0.052	2,100
Fugitive Dust: On-Site Decommissioning	-	-	-	-	24	3.7	-	-	-
Fugitive Dust: On-Site and Off-Site Roads	-	-	-	-	38	3.5	-	-	-
Subtotal	**2.3**	**9.0**	**5.1**	**0.057**	**62**	**7.5**	**7,616**	**0.052**	**7,617**

Table C2
Comparision of Decommissioning Emissions to General Conformity De Minimis Thresholds
NextLight SilverState Solar Project

Hydrographic Area	Emissions (tons)			
	VOC	CO	NO_x	PM_{10}
164A and 164B	1.8	5.2	3.8	59

Hydrographic Area	Emissions (tons)			
	VOC	CO	NO_x	PM_{10}
165	0.11	0.81	0.28	0.61

CO and PM_{10} Nonattainment Area

Hydrographic Area	Emissions (tons)			
	VOC	CO	NO_x	PM_{10}
212	0.40	3.0	1.0	2.2
General Conformity De Minimis Threshold	**-**	**100**	**-**	**70**

Ozone Nonattainment Area

Hydrographic Area	Emissions (tons)			
	VOC	CO	NO_x	PM_{10}
All Areas	2.3	9.0	5.1	62
General Conformity De Minimis Threshold	**100**	**-**	**100**	**-**

Table C3

Emission Factors for Diesel Non-Road Equipment for Decommissioning

NextLight SilverState Solar Project

Construction Equipment Assumptions		Emission Factor Data[1]									
						Emission Factor[2] (g/hp-hr)					
Equipment Type	Equipment Engine Size (hp)	Equipment Used for Emission Factor	SCC	Equipment Size Range	Fuel Type	VOC	CO	NO_x	SO_2	PM	CO_2
Scraper	300	Scrapers	2270002018	175 < hp ≤ 300	Diesel	0.132	0.120	0.281	0.003	0.010	536.410
Tractor	300	Crawler Tractor/Dozers	2270002069	175 < hp ≤ 300	Diesel	0.132	0.120	0.281	0.003	0.010	536.410
Motor grader	200	Graders	2270002048	175 < hp ≤ 300	Diesel	0.132	0.120	0.281	0.003	0.010	536.409
Excavator	195	Excavators	2270002036	175 < hp ≤ 300	Diesel	0.132	0.120	0.281	0.003	0.010	536.409
Dozer	300	Crawler Tractor/Dozers	2270002069	175 < hp ≤ 300	Diesel	0.132	0.120	0.281	0.003	0.010	536.410
Dump truck	275	Off-Highway Trucks	2270002051	175 < hp ≤ 300	Diesel	0.132	0.121	0.281	0.003	0.011	536.409
Drum roller	130	Rollers	2270002015	100 < hp ≤ 175	Diesel	0.132	0.141	0.281	0.003	0.010	536.410
Backhoe/loader	90	Tractor/Loader/Backhoes	2270002066	75 < hp ≤ 100	Diesel	0.132	0.661	0.283	0.003	0.010	695.578
Post Driver	130	Other Construction Equipment	2270002081	100 < hp ≤ 175	Diesel	0.132	0.141	0.281	0.003	0.010	536.410
Crane	275	Cranes	2270002045	175 < hp ≤ 300	Diesel	0.258	0.789	3.710	0.052	0.178	530.236
Grade-all	100	Graders	2270002048	75 < hp ≤ 100	Diesel	0.132	0.393	0.281	0.003	0.010	595.736
Flat Bed Truck	220	Off-Highway Trucks	2270002051	175 < hp ≤ 300	Diesel	0.132	0.121	0.281	0.003	0.011	536.409
Trencher	250	Trenchers	2270002030	175 < hp ≤ 300	Diesel	0.132	0.119	0.281	0.003	0.010	536.410
Forklifts	125	Rough Terrain Forklifts	2270002057	100 < hp ≤ 175	Diesel	0.132	0.141	0.281	0.003	0.010	536.410
Bucket trucks	210	Off-Highway Trucks	2270002051	175 < hp ≤ 300	Diesel	0.132	0.121	0.281	0.003	0.011	536.409
Bullwheel tensioner truck	165	Off-Highway Trucks	2270002051	100 < hp ≤ 175	Diesel	0.132	0.143	0.281	0.003	0.011	536.409
Drum puller truck	460	Off-Highway Trucks	2270002051	300 < hp ≤ 600	Diesel	0.132	0.142	0.281	0.003	0.010	536.409
Pump truck	350	Off-Highway Trucks	2270002051	300 < hp ≤ 600	Diesel	0.132	0.142	0.281	0.003	0.010	536.409
Auger truck	200	Off-Highway Trucks	2270002051	175 < hp ≤ 300	Diesel	0.132	0.121	0.281	0.003	0.011	536.409
Water truck	220	Off-Highway Trucks	2270002051	175 < hp ≤ 300	Diesel	0.132	0.121	0.281	0.003	0.011	536.409

Notes:

1. Emission factors calculated using EPA's NONROAD emission model. Factors for equipment fleet in use in Calendar Year 2050.
2. Emission factors for equipment fleet in use in Calendar Year 2050.

Table C4
Emissions from Diesel Non-Road Equipment for Decommissioning
NextLight SilverState Solar Project

Equipment Type	No. of Units	Equipment Engine Size (hp)	Load	Fuel Type	Estimated Average Daily Usage (hrs/day)	Average Criteria Pollutant Daily Emissions (lbs/day)					Average GHG Daily Emissions (lbs/day)	Total Work Days per Unit	Criteria Pollutant Total Emissions (tons)					GHG Total Emissions (metric tons)
						VOC	CO	NO_x	SO_2	PM	CO_2		VOC	CO	NO_x	SO_2	PM	CO_2
Scraper	1	300	59%	Diesel	7	0.36	0.33	0.77	0.008	0.03	1,465	201	0.036	0.033	0.077	0.0008	0.003	134
Tractor	1	300	59%	Diesel	7	0.36	0.33	0.77	0.008	0.03	1,465	201	0.036	0.033	0.077	0.0008	0.003	134
Motor grader	1	200	59%	Diesel	7	0.24	0.22	0.51	0.005	0.02	977	201	0.024	0.022	0.051	0.0005	0.002	89
Excavator	10	195	59%	Diesel	7	2.34	2.13	4.99	0.053	0.18	9,524	201	0.236	0.214	0.50	0.0054	0.018	868
Dozer	1	300	59%	Diesel	7	0.36	0.33	0.77	0.008	0.03	1,465	201	0.036	0.033	0.077	0.0008	0.003	134
Dump truck	12	275	59%	Diesel	7	3.97	3.64	8.4	0.090	0.33	16,117	201	0.40	0.37	0.85	0.0091	0.033	1,469
Drum roller	1	130	59%	Diesel	7	0.16	0.17	0.33	0.004	0.01	635	201	0.016	0.017	0.033	0.0004	0.001	58
Backhoe/loader	20	90	21%	Diesel	7	0.77	3.86	1.65	0.018	0.06	4,058	201	0.077	0.39	0.17	0.0018	0.006	370
Post Driver	8	130	43%	Diesel	6	0.78	0.83	1.66	0.018	0.06	3,173	201	0.078	0.084	0.17	0.0018	0.006	289
Crane	1	275	43%	Diesel	4	0.27	0.82	3.87	0.054	0.19	553	60	0.008	0.025	0.12	0.0016	0.006	15
Grade-all	1	100	59%	Diesel	7	0.12	0.36	0.26	0.003	0.01	542	201	0.012	0.036	0.026	0.0003	0.001	49
Flat Bed Truck	2	220	59%	Diesel	3	0.23	0.21	0.48	0.005	0.02	921	201	0.023	0.021	0.048	0.0005	0.002	84
Trencher	3	250	59%	Diesel	7	0.90	0.81	1.92	0.020	0.07	3,663	201	0.091	0.082	0.193	0.0021	0.007	334
Forklifts	20	125	59%	Diesel	4	1.72	1.83	3.65	0.039	0.13	6,977	201	0.173	0.184	0.37	0.0039	0.013	636
Bucket trucks	1	210	59%	Diesel	5	0.18	0.17	0.38	0.004	0.02	733	90	0.008	0.007	0.017	0.0002	0.001	30
Bullwheel tensioner truck	2	165	59%	Diesel	6	0.34	0.37	0.72	0.008	0.03	1,381	90	0.015	0.017	0.033	0.0003	0.001	56
Drum puller truck	1	460	59%	Diesel	6	0.47	0.51	1.01	0.011	0.04	1,926	90	0.021	0.023	0.045	0.0005	0.002	79
Pump truck	1	350	59%	Diesel	6	0.36	0.39	0.77	0.008	0.03	1,465	90	0.016	0.017	0.035	0.0004	0.001	60
Auger truck	1	200	59%	Diesel	6	0.21	0.19	0.44	0.005	0.02	837	90	0.009	0.008	0.020	0.0002	0.001	34
Water truck	5	220	59%	Diesel	8.5	1.61	1.47	3.42	0.036	0.13	6,524	201	0.16	0.15	0.34	0.0037	0.013	595
TOTAL						**16**	**19**	**37**	**0.41**	**1.4**	**64,401**	**-**	**1.5**	**1.8**	**3.2**	**0.035**	**0.12**	**5,517**

Table C5
On-Road Vehicle Usage for Decommissioning
NextLight SilverState Solar Project

Vehicle Type	Vehicle Description	Number of trips per day	Total Working Days	Total Daily VMT per Unit (VMT/day)			Total Daily VMT All Units (VMT/day)			Total Overall VMT of All Units (VMT)		
				Unpaved Roads	Paved Roads	TOTAL	Unpaved Roads	Paved Roads	TOTAL	Unpaved Roads	Paved Roads	TOTAL
Heavy Heavy Duty Diesel Truck	Heavy Heavy Duty Diesel Truck	20	201	1	70	71	20	1,400	1,420	4,020	281,400	285,420
Diesel Delivery Trucks	Diesel Delivery Trucks	5	201	1	70	71	5	350	355	1,005	70,350	71,355
Light-Duty Gasoline Vehicles	Lightweight Truck	10	201	16	70	86	160	700	860	32,160	140,700	172,860
	Worker Commute Vehicles[1]	190	201	1	70	71	190	13,300	13,490	38,190	2,673,300	2,711,490
	Subtotal	-	-	-	-	-	*350*	*14,000*	*14,350*	*70,350*	*2,814,000*	*2,884,350*
Gasoline ATVs	Gator/Mule ATVs[2]	10	201	20	0	20	200	0	200	40,200	0	40,200

Notes:

1. Daily VMT estimated based travel of 1 mile on entrance road and an average of 5 miles travelled per hour on site roads for 3 hours of work each day.
2. Daily VMT estimated based on an average of 5 miles travelled per hour for 4 hours of work each day.

Table C6
On-Road Vehicle Exhaust Emission Factors
NextLight SilverState Solar Project

Equipment Type	Emission Factor[1,2] (lb/VMT)							
	VOC	CO	NO_x	SO_2	PM_{10}	$PM_{2.5}$	CO_2	CH_4
Heavy Heavy Duty Diesel Trucks	0.00077178	0.00420297	0.0089899	0.00003946	0.00046717	0.00034564	4.19349747	0.0000363
Diesel Delivery Trucks	0.00088403	0.00569435	0.00589869	0.00002716	0.00027657	0.00020187	2.882988299	0.00003581
Light-Duty Gasoline Vehicles	0.00042052	0.00328779	0.00027141	0.00001076	0.00009687	0.00006415	1.11105829	0.00003518
Gasoline ATVs	0.00335097	0.08229717	0.00085538	0.00000881	0.00014771	0.00014771	0.520249118	-

Notes:

1. Heavy Heavy Duty Diesel Truck Emission Factors based on "Highest (Most Conservative_ EMFAC2007 (version 2.3) Emission Factors for On-Road Heavy-Heavy-Duty Diesel Trucks" (South Coast Air Quality Management District 2010). Scenario Year 2026.

2. Delivery Truck and Passenger Vehicle Emission Factors based on "Highest (Most Conservative_ EMFAC2007 (version 2.3) Emission Factors for On-Road Passenger Vehicles & Delivery Trucks" (South Coast Air Quality Management District2010). Scenario Year 2026.

3. ATV emission factors calculated using EPA's NONROAD emission model. Emission factors for equipment fleet in use in Calendar Year 2050.

Table C7
Exhaust Emissions from On-Road Vehicles for Decommissioning
NextLight SilverState Solar Project

Vehicle Type	Total Miles Travelled (VMT)	Total Criteria Pollutant Emissions (tons)						Total GHG Emissions (metric tons)	
		ROG	CO	NO_x	SO_2	PM_{10}	$PM_{2.5}$	CO_2	CH_4
Heavy Heavy Duty Diesel Trucks	285,420	0.11	0.60	1.3	0.006	0.07	0.05	543	0.005
Diesel Delivery Trucks	71,355	0.03	0.20	0.21	0.0010	0.010	0.007	93	0.001
Light-Duty Gasoline Vehicles	2,884,350	0.61	4.7	0.39	0.016	0.14	0.09	1,454	0.046
Gasoline ATVs	40,200	0.07	1.65	0.02	0.0002	0.003	0.003	9	-
Total	**-**	**0.82**	7.2	**1.9**	**0.02**	**0.22**	**0.15**	**2,099**	**0.052**

Table C8
Fugitive Dust Emission Factors - Roads

Unpaved Roads - Emission Factor Derivation

$E = k(s/12)^a(W/3)^b$ AP-42 Section 13.2.2 (11/06 version)

where:

E = particulate emission factor (lb/VMT)
k, a, b = empirical constants for industrial roads
s = surface material silt content (%)
W = average vehicle weight (tons)

Parameter	Units	PM_{10}	$PM_{2.5}$	Reference
Mean Vehicle Weight	**tons**	7.6	7.6	Assumption
Constant, k	lb/VMT	1.5	0.15	Table 13.2.2-2 (worst case)
Constant, a		0.9	0.9	Table 13.2.2-2 (worst case)
Constant, b		0.45	0.45	Table 13.2.2-2 (worst case)
Silt content, s	%	8.5	8.5	Table 13.2..2-1 (construction sites)
Uncontrolled Emission factor, E	**lb/VMT**	**1.67**	**0.167**	**Calculation**
Control Efficiency for Watering	%	0.65	0.65	Assumption
Controlled Emission factor, E	**lb/VMT**	**0.58**	**0.058**	**Calculation**

Notes:

1. Mean vehicle weight estimated based on average daily use on site roads (20 heavy-duty diesel trucks, 5 diesel delivery trucks, 10 light-duty gasoline trucks, and 10 ATVs).

Paved Roads - Emission Factor Derivation Table

$E = (k(sL/2)^{0.65}(W/3)^{1.5}-C)$ AP-42 Section 13.2.1 (11/06 version)

where:

E = particulate emission factor (lb/VMT)
k = particle size multiplier
sL = road surface silt loading (g/m^2)
W = average vehicle weight (tons)
C = emission factor for 1980's vehicle fleet exhaust, break wear and tire wear

Parameter	Units	PM_{10}	$PM_{2.5}$	Reference
Mean Vehicle Weight	tons	4.4	4.4	Assumption
k factor	lb/VMT	0.016	0.0024	Table 13.2-1.1
Silt Loading, sL	g/m^2	0.06	0.06	Table 13.2.1-3
Emission factor, C	lb/VMT	0.00047	0.00036	Table 13.2.1-2
Uncontrolled Emission factor, E	**lb/VMT**	**0.0024**	**0.00008**	**Calculation**

Notes:

1. Mean vehicle weight based on average traffic on Interstate 15 = 20% heavy-duty diesel trucks and 80% light-duty gasoline vehicles/trucks.

Table C9
Fugitive Dust Emissions from On-Road Vehicle Travel on On-Site and Off-Site Roads During Decommissioning
NextLight SilverState Solar Project

Vehicle Type	Total Miles Travelled on Paved Roads (VMT)	Total Fugitive Dust Emissions from Paved Roads (tons)		Total Miles Travelled on Unpaved Roads (VMT)	Total Fugitive Dust Emissions from Unpaved Roads (tons)		Total Fugitive Dust Emissions from Roads (tons)	
		PM_{10}	$PM_{2.5}$		PM_{10}	$PM_{2.5}$	PM_{10}	$PM_{2.5}$
Heavy Heavy Duty Diesel Trucks	281,400	0.3	0.011	4,020	1.2	0.12	1.5	0.13
Diesel Delivery Trucks	70,350	0.1	0.003	1,005	0.3	0.03	0.4	0.03
Light-Duty Gasoline Vehicles	2,814,000	3.4	0.11	70,350	21	2.1	24	2.2
Gasoline ATVs	0	0	0	40,200	12	1.2	12	1.2
Total	-	**3.9**	**0.12**	-	**34**	**3.4**	**38**	**3.5**

Table C10
Fugitve Dust Emissions from On-Site Decommissioning Activities
NextLight SilverState Solar Project

Activity	Daily Use		Duration of Activity	Emission Factor[1]			Average Daily Emissions (lbs/day)		Total Emissions (tons)	
	Value	Units	(days)	PM_{10}	$PM_{2.5}$	Units	PM_{10}	$PM_{2.5}$	PM_{10}	$PM_{2.5}$
Bulldozing[2]	7	hr/day	201	2.46	1.11	lb/hr	17	7.8	1.7	0.8
Grading[3]	210	VMT/day	201	1.071	0.137	lb/VMT	225	29	23	2.9
Total							**242**	**37**	**24**	**3.7**

Notes:

1. See emission factor derivations below.
2. Daily construction use of 14 hrs/day based on 1 dozers operating 7 hrs/day.
3. Daily construction use of 210 VMT/day based on on 3 scrapers/motor graders/grade-alls operating for 7 hours/day at 10 miles per hour.

Bulldozing and Grading Emission Factor Derivation

Activity	Emission Factor Units	Uncontrolled Emission Factor		Controlled Emission Factor[1]	
		PM_{10}	$PM_{2.5}$	PM_{10}	$PM_{2.5}$
Bulldozing[2]	lb/hr	7.04	3.17	2.464	1.110
Grading[6]	lb/VMT	3.06	0.392	1.071	0.137

Notes:

1. Assume 65% dust control factor based on as-needed watering.
2. Emission factors from AP-42 Section 11.9, Table 11.9-1 (Bulldozing-Overburden). Assume silt content of 8.5% and moisture content of 2%.
3. Emission factors from AP-42 Section 11.9, Table 11.9-1 (Grading). Assume vehicle speed of 10 miles per hour.

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B Biological Mitigation Measures

This section lists measures intended to minimize take of desert tortoise that would be implemented during construction.

1. Authorized biologists would conduct activities including locating desert tortoises and their sign (i.e., conduct presence/absence and clearance surveys) and attempting to ensure that the effects of the project on the desert tortoise and its habitat are minimized in accordance with the measures stated in this BA and the terms and conditions of the biological opinion. Authorized biologists would keep current with the latest information on USFWS protocols and guidelines. An authorized biologist would have thorough and current knowledge of desert tortoise behavior, natural history, and ecology, physiology, and would have demonstrated substantial field experience and training to safely and successfully:

- Handle and temporarily hold desert tortoises
- Excavate burrows to locate desert tortoise or eggs
- Relocate desert tortoises
- Reconstruct desert tortoise burrows
- Unearth and relocate desert tortoise eggs
- Locate, identify, and record all forms of desert tortoise sign

NextLight would obtain approval of authorized biologists from USFWS for individuals who have the appropriate qualifications.

2. Desert tortoise monitors would oversee all project construction activities with the potential to affect the desert tortoise. Desert tortoise monitors would provide oversight to ensure proper implementation of protective measures, record and report desert tortoise and tortoise sign observations in accordance with approved protocol, report incidents of noncompliance in accordance with the biological opinion and other relevant permits, and move desert tortoises from harm's way and place the animals in "safe areas" pre-selected by authorized biologists or maintain the desert tortoises in their immediate possession until an authorized biologist assumes care of the animal.

The desert tortoise monitors would assist the authorized biologists during surveys and often serve as "apprentices" to acquire experience. Desert tortoise monitors would not be authorized to conduct desert tortoise presence/absence or clearance surveys unless directly supervised by an authorized biologist. Directly supervised means the authorized biologist would be in direct voice and sight contact with the desert tortoise monitor.

Desert tortoise monitors would be individuals who have appropriate qualifications and have been approved by an authorized biologist.

3. A Worker Environmental Awareness Program (WEAP) would be prepared to address the types of construction activities that may affect the desert tortoise. The WEAP would describe the protective measures stipulated in the biological assessment and in the terms and conditions of the biological opinion. Special emphasis would be placed on explaining the protective measures developed for the desert tortoise and the consequences of noncompliance. At a minimum, the program would contain information on physical characteristics, distribution, behavior, ecology, sensitivity to human activities, legal protection, penalties for violations, reporting requirements, and protective measures associated with the desert tortoise. Information provided in a fact sheet developed by BLM entitled "The Threatened Desert Tortoise" would be incorporated into the WEAP. The WEAP would be administered to all onsite personnel including employees, contractors, contractors' employees, supervisors, inspectors, subcontractors, and delivery personnel. The program would be administered onsite by the authorized biologist or desert tortoise monitor. It may include an oral presentation, video/PowerPoint, and written materials. The WEAP would be approved by the BLM and USFWS.

4. NextLight would designate a field contact representative (FCR) who would be responsible for overseeing compliance with the protective measures. The FCR would be onsite during all activities that may result in the take of the desert tortoise. The FCR would have the authority to halt all activities that are in violation of the desert tortoise protective measures identified in the biological opinion. If the FCR identifies a violation of the desert tortoise protective measures, work would proceed only after corrective measures have been taken. The FCR would have a copy of the biological opinion with them during all construction activities. The FCR may be an authorized biologist, desert tortoise monitor, construction supervisor, or any other employee with the authority to halt construction activity.

5. During construction, NextLight would comply with the Guidelines for Handling Desert Tortoises during Construction Projects (Desert Tortoise Council, 1999) or the most current guidelines available.

(a) The boundaries of all areas to be disturbed (for example, project site, stormwater drainage control features, and linear corridors) would be flagged before beginning any activities, and all disturbances would be confined to the flagged areas. All survey crews on site prior to construction would be escorted by an authorized biologist. All

project vehicles and equipment would be confined to the flagged areas. Survey crew vehicles would remain on existing roads. Disturbance beyond the construction zone would be prohibited except to complete a specific task within designated areas or emergency situations.

(b) NextLight would relocate tortoises currently occupying the area within the solar field following the USFWS-approved protocol (Desert Tortoise Council, 1999). If the Desert Tortoise Council releases a revised protocol for handling desert tortoises before initiation of project activities, the revised protocol would be implemented for the Project. The relocation/translocation effort would adhere to the following procedures as well as those stipulated in the Terms and Conditions of the Biological Opinion.

(c) NextLight would identify relocation/translocation sites for tortoises relocated from within the solar field and prioritize selection of potential relocation/translocation sites that are located immediately adjacent to the north, east, and west of the Project site subject to approval by the BLM and USFWS.

(d) The authorized biologist would maintain a record of all desert tortoises encountered and relocated during project surveys and monitoring. This information would include for each individual: the locations (narrative, vegetation type, and maps) and dates of observations; general conditions and health; all apparent injuries and state of healing; if moved, the location from which it was captured and the location in which it was released (whether animals voided their bladders); and diagnostic markings (such as identification numbers, if present).

(e) All burrows with the potential to be occupied by tortoises within the solar field fenced area would be searched for presence. In some cases, a fiber optic scope could be used to determine presence or absence within a deep burrow. Burrows inhabited by tortoises would be excavated using hand tools by authorized biologists or desert tortoise monitors. The biologists or monitors would be supervised by an authorized biologist. To prevent reentry by a tortoise or other wildlife, all burrows would be collapsed after absence has been determined. Tortoises excavated from burrows would be relocated immediately following excavation to unoccupied natural or artificial burrows outside the fenced area. Prior to release, tortoises would have an identification number affixed to the shell with epoxy.

(f) Tortoises within the solar field fenced area would be relocated to unoccupied natural or artificially constructed burrows. Relocated tortoises would be placed in burrows of similar size, shape, and orientation. If an existing burrow similar to the original burrow is not available, the authorized biologist or desert tortoise monitor would construct one. Burrow construction would follow the appropriate protocols outlined in Guidelines for Handling Desert Tortoise during Construction Projects (Desert Tortoise Council, 1999) .The animals would be transported in clean cardboard boxes. A new box would be used for each individual tortoise and would be properly discarded after a single use. The new burrow would be located at least 300 feet from the outside of a fenced area and would be of similar size, shape and orientation to the

original burrow. The new burrow locations would be determined by the authorized biologist. Relocated tortoises would not be placed in existing occupied burrows.

(g) The authorized biologist would wear disposable surgical gloves when handling desert tortoises. A new pair of gloves would be used for each tortoise handled to avoid the transmission of upper respiratory tract disease (URTD). Shell notching would not be performed. All equipment used on the tortoises would be sterilized between each use.

(h) Desert tortoises would be treated in a manner to ensure that they do not overheat, exhibit signs of overheating (gaping, foaming at the mouth, etc.), or are placed in a situation where they cannot maintain surface and core temperatures necessary to their well-being. Desert tortoises would be kept shaded at all times until it is safe to release them. No desert tortoise would be captured, moved, transported, released, or purposefully caused to leave its burrow for any reason when the ambient air temperature is above 95 degrees Fahrenheit (°F) (35°C). Ambient air temperature would be measured in the shade, protected from wind, at a height of 2 inches (5 centimeters) above the ground surface. No desert tortoise would be captured if the ambient air temperature is anticipated to exceed 95°F (35°C) before handling and relocation/translocation can be completed. If the ambient air temperature exceeds 95°F (35°C) during handling or processing, desert tortoises would be kept shaded in an environment that does not exceed 95°F (35°C), and the animals would not be released until ambient air temperature declines to below 95°F (35°C).

(i) To monitor for survivorship and health, for a period of 1 year following their relocation/translocation, the desert tortoises within the relocation/translocation area would be surveyed monthly by the authorized biologist during the periods of activity (spring: March to May, and fall: August to October) and once during the two non-active periods (summer: June to July, and winter: November to February). For the following 2 years, the relocation/translocation area would be surveyed at least once in the spring and once in the fall. The focus of these surveys would be to locate and observe relocated tortoises. An authorized biologist would determine the level of effort and methods needed to locate tortoises. All pertinent information on tortoises observed would be recorded, such as behavior, physical characteristics, health characteristics and any visible signs of URTD, as well as any potential anomalies the individual desert tortoise might display.

6. Tortoise handling, artificial burrow construction, egg handling and other procedures would follow those described in the Guidelines for Handling Desert Tortoise during Construction Projects (Desert Tortoise Council, 1999) for all tortoise relocation/translocation.

7. A relocation/translocation plan for desert tortoises would be developed following guidance from the DTRO. This guidance is currently in draft form. All relocation and translocation activities would adhere to this plan as well as the terms and conditions of the Biological Opinion.

8. Prior to the initiation of solar field construction activities of, NextLight would enclose the boundary of a solar field construction area with desert tortoise exclusionary fencing; both permanent and temporary. Permanent chain-link fencing around the perimeter of the solar field would include desert tortoise exclusionary fencing attached to the bottom of the chain link fencing in areas where appropriate to permanently maintain the separation of the solar field and remaining desert tortoise habitat. The design of the permanent desert tortoise exclusionary fencing would follow that specified by USFWS. Desert tortoise guards would be installed at the gated entries to prevent desert tortoises from gaining entry. Permanent fencing would prevent tortoises from entering the Project site for the duration of facility operation. The temporary exclusionary fencing of construction areas would consist of galvanized hard wire cloth, silt fencing, or orange construction fencing. The fencing would be buried approximately 6 inches below ground or bent at a right angle toward the outside of the work area and covered with dirt, rocks, or gravel to discourage desert tortoises from digging under the fence. Temporary fencing would prevent tortoises from entering a cleared construction area.

9. The exclusionary fencing of a solar field construction area would be installed prior to the onset of clearing and grubbing. The fence installation would be supervised and monitored under the direction of authorized biologists and desert tortoise monitors. Ongoing maintenance of the fencing would be performed with the oversight of an authorized biologist.

10. Within 24 hours before installing the desert tortoise exclusionary fencing around the boundary of a solar field construction area, a desert tortoise survey would be conducted using techniques providing 100 percent coverage of the fenced construction area to provide coverage of an area approximately 60 feet wide centered on the fence alignment. Transects would be no greater than 30 feet apart. The fence alignment would be flagged prior to the biological survey. Two complete passes of complete coverage would be conducted. All desert tortoise burrows, and burrows constructed by other species that might be used by desert tortoises, would be examined and excavated to their terminus to determine occupancy. Any burrow within the fence line would be collapsed after confirmation that it is not occupied by a desert tortoise, or if occupied, the desert tortoise has been removed. Removed tortoises would be relocated. The authorized biologists would be primarily responsible for this survey.

(a) Following installation of desert tortoise exclusionary fencing, the solar field construction area would be cleared of desert tortoises. Up to three complete passes with complete coverage would be conducted. The first pass transects would be conducted at 15-foot intervals. Subsequent transects would be no wider than 30 feet. Each separate survey would be walked in a different direction to allow opposing angles of observation. Two consecutive passes would be completed without finding any tortoises or new tortoise sign prior to declaring the site clear of tortoises. If no desert tortoises are observed during the second survey, a third survey would not be conducted. The authorized biologists would be primarily responsible for the clearance

surveys. Some authorized biologists may be substituted with desert tortoise monitors and would be placed between authorized biologists during the surveys. After the area surveyed is determined to be absent of desert tortoises, the areas may be open to a vegetation salvage program, if the BLM stipulates vegetation salvage.

(b) All potential desert tortoise burrows located would be excavated by hand by an authorized biologist, desert tortoises removed, and collapsed or blocked to prevent occupation by desert tortoises. If excavated during May through July, the authorized biologist would search for desert tortoise nests/eggs, which are typically located near the entrance to burrows. All desert tortoise handling and removal, and burrow excavations, including nests, would be conducted by an authorized biologist in accordance with the USFWS-approved protocol (Desert Tortoise Council, 1999). If the Desert Tortoise Council releases a revised protocol for handling of desert tortoises before initiation of project activities, the revised protocol would be implemented for the project.

(c) Following the desert tortoise clearance and relocation/translocation out of a solar field construction area and vegetation salvage, heavy equipment would enter the solar field fenced sites to clear, grub, level, and trench. A desert tortoise monitor would be on site during initial clearing and grading to relocated tortoises missed during the clearance survey. Should a desert tortoise be discovered, an authorized biologist would remove the tortoise.

11. The transmission line and new access ROWs would be surveyed and, if necessary, cleared of desert tortoises. Tortoises would not be relocated from these areas unless an occupied burrow is observed. Tortoises excavated from burrows would be relocated to unoccupied natural or artificially constructed burrows immediately following excavation. The artificial or unoccupied natural burrows must occur 150 to 300 feet from the original burrow. Relocated tortoises would not be placed in existing occupied burrows. If an existing burrow that is similar in size, shape, and orientation to the original burrow is unavailable, the authorized biologist would construct one. Desert tortoises moved during less active periods would be monitored for at least 2 days after placement in the new burrows to ensure their safety. The authorized biologist would be allowed some judgment and discretion to ensure that survival of the desert tortoise is likely. Desert tortoises that are found above ground and need to be moved from harm's way would be placed in the shade of a shrub, from 150 to 300 feet from the point of encounter. The authorized biologist would inform workers in the area that the tortoise is present and may re-enter the work area. Relocation/translocation would be authorized by the USFWS biological opinion and would be part of the overall project relocation/translocation activity.

12. The stormwater drainage control features construction areas would be temporarily fenced. The temporary exclusionary fencing would consist of galvanized hard wire cloth, silt fencing, or orange construction fencing. The fencing would be buried approximately 6 inches below ground or bent at a right angle toward the outside of the work area and covered with dirt, rocks or gravel

to discourage desert tortoises from digging under the fence. The fence installation would be supervised and monitored under the direction of authorized biologists and desert tortoise monitors during construction. The stormwater drainage control features construction areas would be surveyed and, if necessary, cleared of desert tortoises. Tortoises found in a burrow would be relocated. Tortoises excavated from burrows would be relocated to unoccupied natural or artificially constructed burrows immediately following excavation. The artificial or unoccupied natural burrows would be located 150 to 300 feet from the boundary of the construction area. Relocated tortoises would not be placed in existing occupied burrows. If an existing burrow that is similar in size, shape, and orientation to the original burrow is unavailable, the authorized biologist would construct one. Desert tortoises moved during less active periods would be monitored for at least 2 days after placement in the new burrows to ensure their safety. The authorized biologist would be allowed some judgment and discretion to ensure that survival of the desert tortoise is likely.

13. Access by project-related personnel to the Project site would be restricted to established access roads. Cross-country vehicle and equipment use outside designated work areas would be prohibited.

14. NextLight would require personnel to exercise caution when traveling to and from the site. To minimize the likelihood of vehicle strikes of desert tortoises outside the fenced areas, a 25 mile per hour speed limit would be enforced on authorized access routes to the work site. Speed limit signs would be posted on both sides of these roads.

15. Trash receptacles at the work site would have self-locking lids to prevent entry by opportunistic predators such as common ravens and coyotes. Trash receptacles would be emptied at least weekly or when full.

16. Other than law enforcement or security personnel, project personnel would be prohibited from bringing pets and firearms to the project site.

17. Project employees working outside a cleared, fenced area would be required to check under a vehicle or equipment before it is moved. If a desert tortoise is encountered the vehicle would not be moved until the animal has voluntarily moved a safe distance from the parked vehicle. Desert tortoises may be moved by an authorized biologist or desert tortoise monitor for this purpose.

All activities would be restricted to pre-approved locations. If unforeseen circumstances require expansion of activities, the potential expanded work areas would require approval by the BLM and possibly re-initiation of the Section 7 consultation. The expanded work areas would be

surveyed by an authorized biologist for desert tortoises prior to requesting approval from the BLM. Use of protection measures would be implemented within the expanded work areas based on the judgment of the BLM and an authorized biologist.

18. At the end of each work day, NextLight would ensure that bores and other excavations outside the permanently fenced area that constitute wildlife pitfalls would either be immediately backfilled, sloped at a 3:1 ratio at the ends to provide tortoises and other wildlife escape ramps, covered, or fully enclosed with fencing to prevent any entrapment. All excavations outside a fenced area would be inspected periodically throughout and at the end of each workday by an authorized biologist, desert tortoise monitor, or the FCR. Should a tortoise become entrapped, an authorized biologist would remove and relocate the tortoise to a safe location.

19. Any construction pipe, culvert, or similar structure with a diameter greater than 3 inches, stored less than 8 inches above ground and within desert tortoise habitat (outside a fenced area) for one or more nights, would be inspected for tortoises before the material is moved, buried, or capped. As an alternative, all such structures may be capped before being stored outside the fenced area, or placed on pipe racks. These materials would not need to be inspected or capped if they are stored within a fenced area after the clearance surveys have been completed.

20. All vehicles and equipment would be maintained in proper working condition to minimize the potential for fugitive emissions of motor oil, antifreeze, hydraulic fluid, grease, or other hazardous materials. All fuel or hazardous waste leaks, spills, or releases would be stopped or repaired immediately and cleaned up at the time of occurrence. NextLight would be responsible for spill material (including contaminated soil) removal and disposal to an approved offsite landfill or other licensed facility. Servicing of construction equipment would take place only at a designated area. Service/maintenance vehicles would carry a bucket and pads to absorb leaks or spills.

21. All unused material and equipment, including soil and rock piles, would be removed upon completion of any construction activities located outside the permanently fenced area.

22. To compensate for desert tortoise impacts of the Project, NextLight would offset these effects by paying a per acre fee for lands that are being disturbed. This remuneration would be used by the federal agencies to fund management actions expected to provide a direct benefit to the tortoise over time. Action may include: habitat acquisition, population or habitat enhancement or protection, research that increases knowledge of desert tortoise biology, habitat requirements or factors affecting habitat attributes, reducing loss of animals, or other actions.

23. An authorized biologist or FCR would notify the BLM and USFWS within 24 hours upon locating a dead or injured desert tortoise. The notification would be made by telephone and in writing. The report would include the date and time of the finding or incident (if known), location of the carcass, a photograph, cause of death (if known), and other pertinent information. Tortoises fatally injured or killed from Project-related activities would be submitted for necropsy, at the expense of NextLight, as outlined in Salvaging Injured, Recently Dead, Ill, and Dying Wild, Free-Roaming Desert Tortoises (Gopherus agassizii) (Berry, 2001). Tortoises with minor injuries would be transported to a nearby qualified veterinarian for treatment at the expense of NextLight. If an injured animal recovers, the BLM, USFWS, and NDOW would be contacted by NextLight for final disposition of the animal.

24. A Weed Management Plan would be prepared and submitted to the BLM for review and approval before construction begins so that weed prevention and control practices are part of pre construction, construction and post construction management phases. This plan would follow the Las Vegas Field Office's Resource Management Plan (BLM, 1998), Las Vegas Field Office Noxious Weed Plan (BLM, 2006), and the BLM guidance Partners Against Weeds (BLM, 1996) interagency Pulling Together National Strategy for Invasive Plant Management (DOI, 1998) and the National Invasive Species Management Plan (DOI, 2001) for an active integrated weed management program using weed prevention measures and weed control BMPs.

25. NextLight would develop a Site Rehabilitation Plan for the revegetation and rehabilitation of areas disturbed by the Project. This plan would be implemented immediately after construction for the areas that are temporarily disturbed, such as portions of the transmission line route that involve disturbance.

Operation and Maintenance Minimization Measures

The following protection measures would be common to all O&M activities performed during life of the Project outside of the permanently fenced solar field areas:

1. NextLight would designate an FCR who would be responsible for overseeing compliance with the desert tortoise protection measures during operation or maintenance activities outside of the permanently fenced area of the solar field. The on-call FCR would be an authorized biologist approved by the BLM and USFWS. The FCR would follow the applicable measures described in Section 2.6.1 to reduce effects to desert tortoise or further habitat disturbance.

2. NextLight would notify the BLM and USFWS within 24 hours upon locating a dead or injured desert tortoise. Tortoises with minor injuries would be transported to a nearby qualified

veterinarian for treatment at the expense of NextLight. If an injured animal recovers, the BLM and USFWS would be contacted by NextLight for final disposition of the animal.

3. Vehicle parking, material stockpiles, and construction-related materials used for maintenance or repair activities would be located within the permanently fenced area.

4. WEAP training would continue for all Project personnel during the operation phase. All employees and contractors involved with operation and maintenance would attend the agency-approved WEAP training. These employees would participate in the education program prior to initiation of work activities. New employees would receive formal, approved training prior to working on site. During the WEAP training, employees would be instructed to exercise caution when commuting to the project area. To minimize the likelihood for vehicle strikes of desert tortoises, the posted speed limit on the access roads would be 25 miles per hour. Speed limit signs would be posted on both sides of access roads to remind drivers of the speed limit when entering and exiting. This training would be conducted by NextLight personnel familiar with the approved WEAP.

5. Existing routes of travel to and from the Project site would be used outside the cleared and fenced areas. Cross-country use of vehicles and equipment outside the cleared and fenced areas would be strictly prohibited.

C Visual Resources Contrast Rating Forms

The following appendix includes the visual resources contrast rating forms prepared by the applicant in consultation with BLM (CH2M Hill 2009).

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Nevada Visual Resource Inventory

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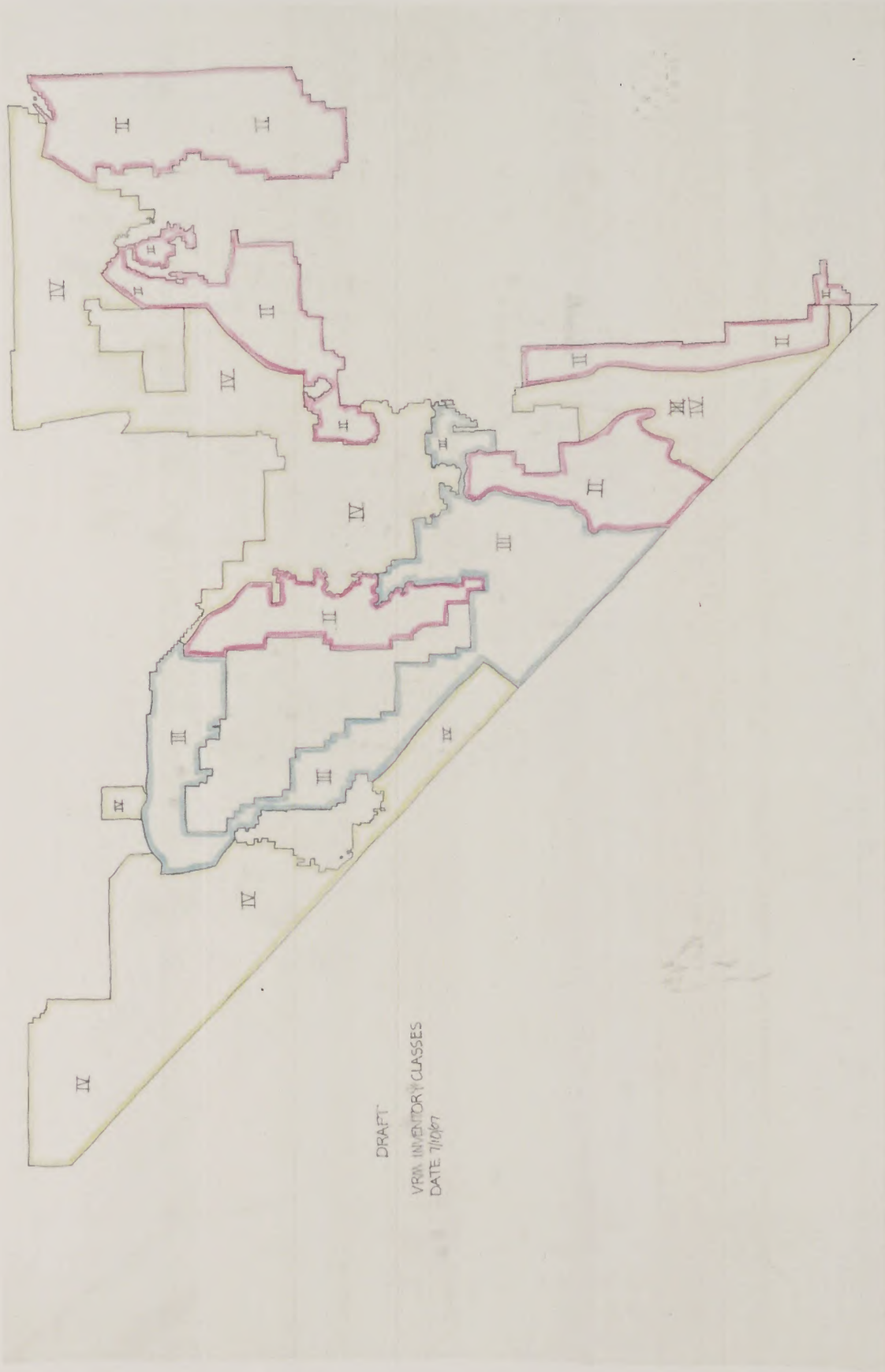
Las Vegas Field Office
DRAFT
VRM II INVENTORY OVERLAY
7/10/07


DRAFT
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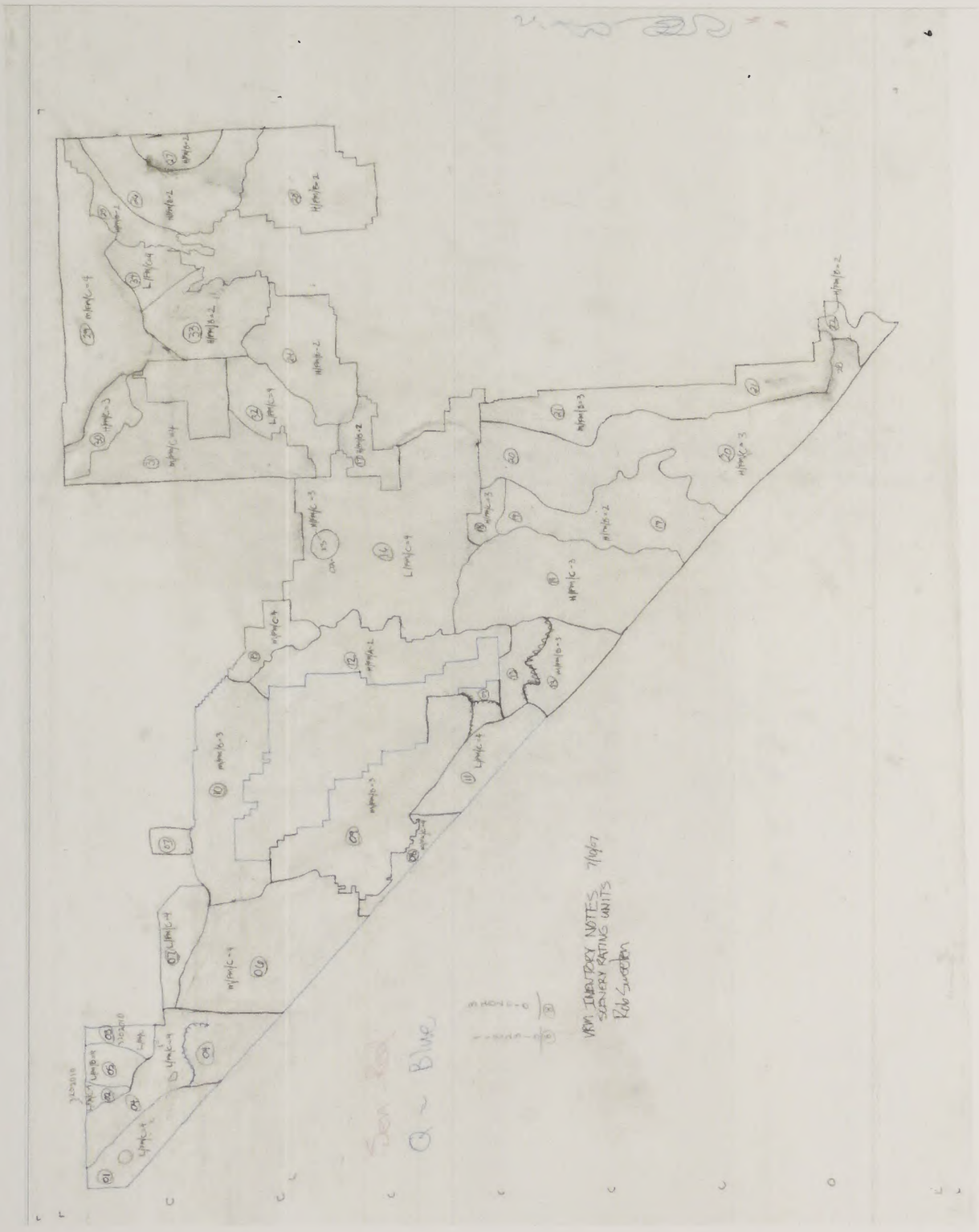
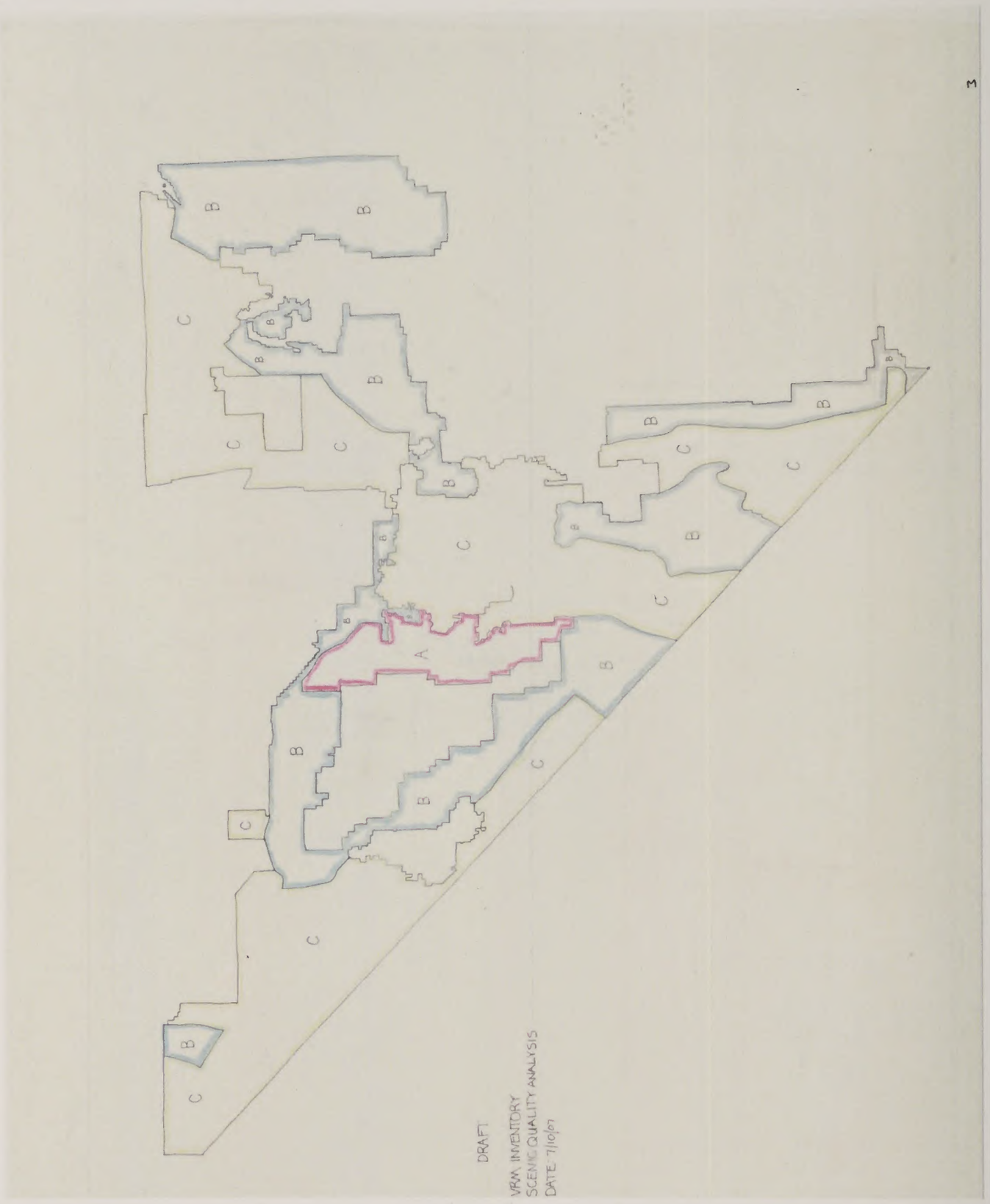
DATE 7/10/87




DRAFT
VRM INVENTORY
SCENIC QUALITY ANALYSIS
DATE 7/10/07

California Visual Resource Inventory

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Form 8400-5

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
SCENIC QUALITY RATING SUMMARY

Date: 5/28/2008
District/ Field Office: NEEDLES – NORTH
Resource Area: Topo – KINGMAN

1. Evaluators (*names*)
SALLY MURPHY, MONA DANIELS, CARL RUKALZEWSKI, ROB SWEETEN, JARROD KELLO

SCENIC QUALITY RATING UNITS (1)	(2)Landform	(3)Vegetation	(4)Water	(5)Color	(6)Adjacent Scenery	(7)Scarcity	(8)Cultural Modification	(9)Total Score	(10)Scenic Quality Rating	EXPLANATION (11)
W									A	Designated Wilderness
01	5	3	2	4	5	3	0	22	A	Horse Thief Canyon (Kingston)
02	2	1	0	2	2.5	1	0	8.5	C	Western Mesquite Valley ~~(ALEC)~~
03	2	2	0	3	3.5	3	0	13.5	B	Mesquite Lake Bed (ALEC)
04	3	2	0	3	3	1	0	12	B	Turquoise Hills
05	1	1	0	2	2	1	0	7	C	Cima Road
06	3.5	3	0	3	3.5	2	0	15	B	Clark Mountain
07	5	4	0	4	4	2	0	19	A	Kokoweef
08	1.5	1	2	2.5	3	1	0	11	C	Stateline (Ivanpah)
09	4	3	0	3	2.5	2.5	0	15	B	Castle Mountains (Hills)
10	1	1	0	2	2	1	0	7	C	Castle Mountains (Flats)
11	2	1	0	2	3	1	0	9	C	Piute Valley
12	2	2	0	2	3	1	0	10	C	Homer Mountain
										END

INSTRUCTIONS
Form is used in conjunction with the Scenic Quality, Inventory and Evaluation Chart.

SCENIC QUALITY
INVENTORY AND EVALUATION CHART

Key Factors	Rating Criteria and Score		
Landform	High vertical relief as expressed in prominent cliffs, spires, or massive rock outcrops; or severe surface variation or highly eroded formations including major badlands or dune systems; or detail features dominant and exceptionally striking and intriguing such as glaciers. 5	Steep canyons, mesas, buttes, cinder cones, and drumlins; or interesting erosional patterns or variety in size and shape of landforms; or detail features which are interesting though not dominant or exceptional. 3	Low rolling hills, foothills, or flat valley bottoms; or few or no interesting features. 1
Vegetation	A variety of vegetative types as expressed in interesting forms, textures, and patterns. 5	Some variety of vegetation, but only one or two major types. 3	Little or no variety or contrast in vegetation. 1
Water	Clear and clean appearing, still, or cascading white water, any of which are a dominant factor in the landscape. 5	Flowing, or still, but not dominant in the landscape. 3	Absent, or present, but not noticeable 0
Color	Rich color combinations, variety or vivid color; or pleasing contrasts in the soil, rock, vegetation, water or snow fields. 5	Some intensity or variety in colors and contrast of the soil, rock, and vegetation, but not a dominant scenic element. 3	Subtle color variations, contrast, or interest; generally mute tones. 1
Influence of **Adjacent Scenery**	Adjacent scenery greatly enhances visual quality. 5	Adjacent scenery moderately enhances overall visual quality. 3	Adjacent scenery has little or no influence on overall visual quality. 0
Scarcity	One of a kind; or unusually memorable, or very rare within region. Consistent chance for exceptional or wildflower viewing, etc. ** 5+	Distinctive, though somewhat similar to others within the region. 3	Interesting within its setting, but fairly common within the region. 1
Cultural Modifications	Modifications add favorably to visual variety while promoting visual harmony. 2	Modifications add little or no visual variety to the area, and introduce no discordant elements. 0	Modifications add variety but are very discordant and promote strong disharmony. -4

** A rating of greater than 5 can be given but must be supported by written justification.

INSTRUCTIONS

Purpose: To rate the visual quality of the scenic resource on all BLM managed lands.

How to Identify Scenic Value: All Bureau lands have scenic value.

How to Determine Minimum Suitability: All BLM lands are rated for scenic values. Also rate adjacent or intermingling non-BLM lands within the planning unit.

When to Evaluate Scenic Quality: Rate for scenery under the most critical conditions (i.e., the highest user period or season of use, sidelight, proper atmospheric conditions, etc.).

How to Delineate Rating Areas: Consider the following factors when delineating rating areas.

1. Like physiographic characteristics (i.e., landform, vegetation, etc.).

2. Similar visual patterns, texture, color, variety, etc.

3. Areas which have a similar impact from cultural modifications (i.e., roads, historical and other structures, mining operations, or other surface disturbances).

Explanation of Criteria:
(See Illustration 1.)

NOTE: Values for each rating criteria are maximum and minimum scores only. It is also possible to assign scores within these ranges.

SCENIC QUALITY

A = 19 or more
B = 12-18
C = 11 or less

Form 8400-6

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
SENSITIVITY LEVEL RATING SHEET

Date: 5/28/2008
District/ Field Office: NEEDLES – NORTH
Resource Area: TOPO - KINGMAN

1. Evaluators (*names*)
SALLY MURPHY, NONA DANIELS, CARL RUKACZEWSKI, ROB SWEETEN, JARROD KELLOGG

SENSITIVITY LEVEL RATING UNITS (1)	(2)Type of User	(3)Amount of Use	(4)Public Interests	(5)Adjacent Land Uses	(6)Special Areas	(7)Other Factors	(8)Overall Rating	EXPLANATION (9)
W							H	Designated Wilderness
01	H	L	M	H	H	—	H	HORSE THIEF CANYON (KINGSTONS)
02	H	L	M	H	H	—	H	WESTERN MESQUITE VALLEY (~~FACE~~
03	H	L	M	H	H	H	H	MESQUITE LAKE BED (ACEC)
04	H	H	M	H	H	H	H	TURQUOISE HILLS
05	L	M	M	H	H	H	M	CIMA ROAD
06	H	H	H	H	H	—	H	CLARK MOUNTAIN
07	H	H	H	H	H	H	H	KOKOWEEF
08	M	L	L	H	H	H	M	STATELINE (Ivanpah)
09	M	L	M	H	H	—	M	CASTLE MOUNTAINS (HILLS)
10	M	L	M	H	H	—	M	CASTLE MOUNTAINS (FLATS)
11	M	H	M	H	H	—	H	PIUTE VALLEY
12	M	H	L	H	M	—	M	HOMER MOUNTAIN
								END

(Instructions on reverse)

INSTRUCTIONS

Steps in the Sensitivity Level Analysis

1. Divide the inventory area into logical sensitivity rating units

2. Analyze the factors which indicate visual sensitivity

3. For each rating unit, rate each factor as high, moderate, or low using the following outline as a general guide:

   a. *Type of Users*. Maintenance of visual quality is:

      — a major concern for most users ..... High

      — a moderate concern for most users. ..... Moderate

      — a low concern for most users ..... Low

   b. *Amount of use*. Maintenance of visual quality becomes more important as the level of use increases(see table below):

      — high level of use ..... High

      — moderate level of use ..... Moderate

      — low level of use ..... Low

   c. *Public Interest*. Maintenance of visual quality is:

      — a major public issue ..... High

      — a moderate public issue ..... Moderate

      — a minor public issue ..... Low

   d. *Adjacent Land Uses*. Maintenance of visual quality to sustain adjacent land use objectives is:

      — very important ..... High

      — moderately important ..... Moderate

      — slightly important ..... Low

   e. *Special Area*. Maintenance of visual quality to sustain Special Area management objectives is:

      — very important ..... High

      — moderately important ..... Moderate

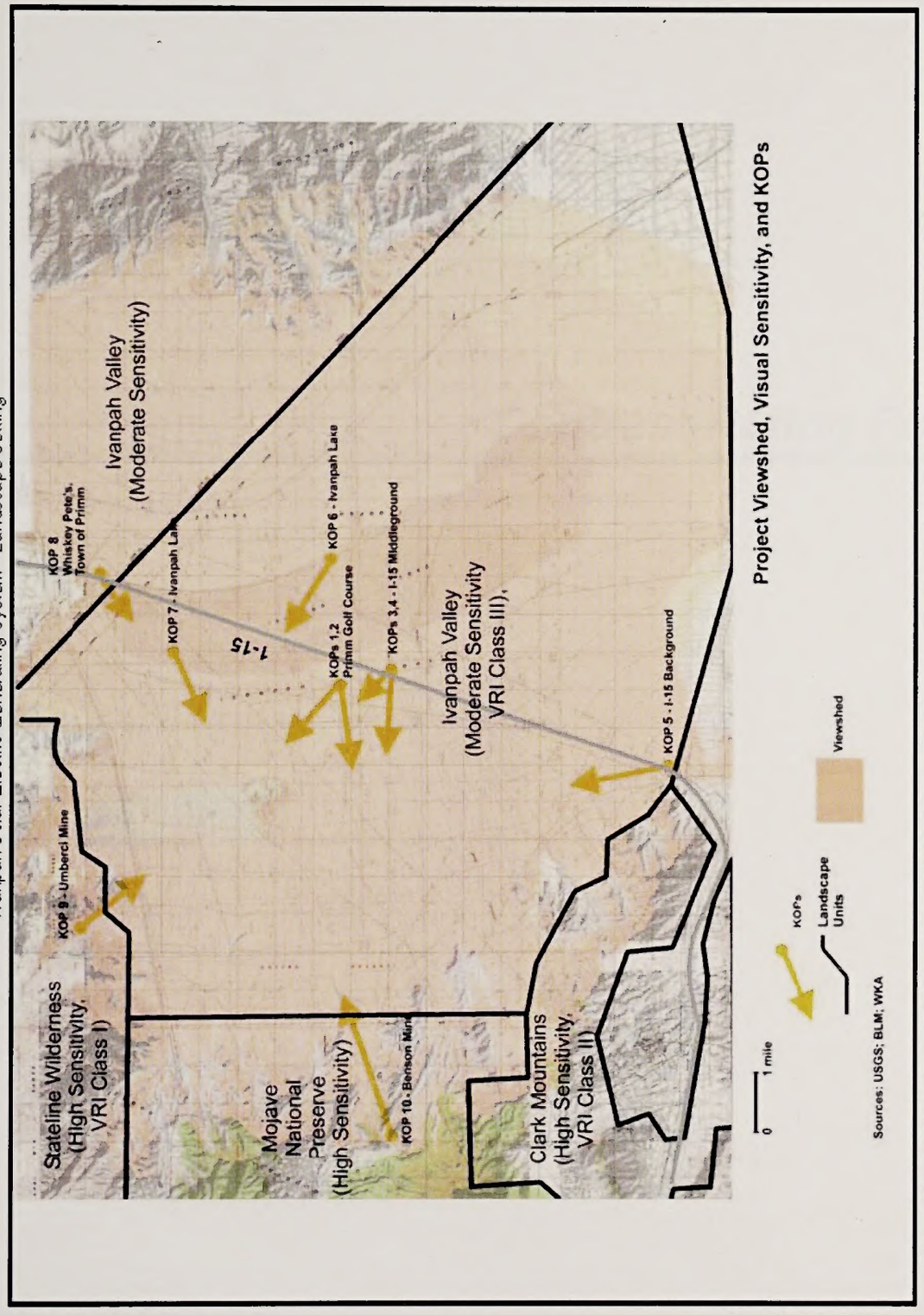
      — slightly important ..... Low

4. Determine the over-all sensitivity level for each rating unit. This is a judgmental process which requires a careful analysis of all the above factors. Review the ratings given to each factor and analyze the relationship between factors. A high rating in any one factor does not necessarily mean that the over-all sensitivity level rating should be high. For example, the rating for "type of users" might be high but the "amount of use" might be low. Consequently, the over-all rating could be low or moderate. Management should be involved in this rating process.

5. Record the ratings and explanation on the sensitivity level rating sheet.

TABLE FOR CLASSIFYING AMOUNT OF USE

TYPE AREA	HIGH	MODERATE	LOW
Roads & Highways Rivers & Trails Recreation Sites	Greater than 45,000 visits/yr. Greater than 20,000 visits/yr. Greater than 10,000 visitor days/yr.	5,000-45,000 visits/yr. 2,000-20,000 visits/yr. 2,000-10,000 visitor days/yr.	Lesser than 5,000 visits/yr. Lesser than 2,000 visits/yr. Lesser than visitor 2,000 days/yr.



VISUAL RESOURCES - FIGURE 2
Ivanpah Solar Electric Generating System - Landscape Setting

U.S. BUREAU OF LAND MANAGEMENT and CALIFORNIA ENERGY COMMISSION, SITING, TRANSMISSION AND ENVIRONMENTAL PROTECTION DIVISION, OCTOBER 2009
SOURCE: WK Figure 2

OCTOBER 2009 VISUAL RESOURCES

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Contrast Rating Forms

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SECTION A. PROJECT DESCRIPTION

District/Field Office: Las Vegas Field Office	Date: 11/19/09
Key Observation Point: 1 Goodsprings Road	
Location: 2234631.105 x 760173.7145	

SECTION B. CHARACTERISTIC LANDSCAPE DESCRIPTION

	Land/Water	Vegetation	Structures
Form	Upward sloping plain in the foreground, conical and linear hill forms in the middle to background	Mixed with short rounded shrubs and scattered, jagged vertical Joshua trees in foreground Middleground and background indistinct	Linear utility poles in middleground are indistinct. Distant buildings faint in the background
Line	Edge of alluvial fun creates line in foreground, Triangular mountain in foreground, . mountains in BG undulating and smooth	Joshua trees add a weak vertical element	Power line in MG creates a weak vertical line BG: Primm and power plant create weak lines.
Color	FG: grey to grayish brown BG: Off-white lake bed and light to dark browns sloped areas	Warm tones of green, olive, brown and gray in FG brownish gray with black shadows in background	Appear grayish from this distance.
Texture	Ivanpah Valley floor is smooth, mountains in middle and background are of medium texture.	Foreground vegetation is coarse grained and of medium density. Middle and background vegetation seen as a smooth surface.	Primm, the power plant, and the utility poles are of medium coarseness but sparsely distributed.

SECTION C. PROPOSED ACTIVITY DESCRIPTION

	Land/Water	Vegetation	Structures
Form	same	Same	Solar collector fields create flat, slightly contrasting geometric appearing forms on alluvial fan in the distant view.
Line	Same	Same	Flat forms created by collector fields defined by straight lines.
Color	Same	Same	Dark color of collector fields contrasts with the vegetated surface of the alluvial fan on which they are located.
Texture	Same	Same	At this distance, collector fields appear to have a smooth texture.

SECTION D. CONTRAST RATING ☐ SHORT TERM ☒ LONG TERM

1. Degree of Contrast		Features												2. Does project design meet VRM objectives? ☒ Yes ☐ No (explain on back)
		Land/Water Body				Vegetation				Structures				
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	3. Additional mitigating measures recommended ☒ Yes ☐ No (explain on back)
Elements	Form				X				X		X			Evaluator's Names: Mark Chandler, Tom Priestley, Tom Dildine, MariaElena Conserva Date: 11/19/09
	Line				X				X		X			
	Color				X				X		X			
	Texture				X				X			X		

Comment from item 2.

See Visual Resources Technical Report (CH2M HILL, 2009) for detailed discussion of analysis.

Additional Measures (See item 3)

As the impact analysis described in the Visual Resources Report indicates, the Project would be consistent with the VRM Class III objectives that the BLM has established for the lands included within the Project area. Because the BLM has requested that the visual changes associated with the Project be minimized, the following mitigation measures have been recommended by the BLM, and NextLight will implement these voluntary measures:

Solar field access ways will be offset at appropriate intervals to minimize the appearance of straight lines within the solar field.

The exterior of the inverter boxes and the exterior of the O&M building should be factory treated with a dull finish and a BLM standard environmental color, such as Yuma Green or Covert Green that will minimize their contrast with the surrounding environment.

A plan will be prepared to revegetate areas disturbed by construction of flood control berms and channel improvements. Berms and channel improvements will be blended into the natural landscape to the extent practical.

SECTION A. PROJECT DESCRIPTION

District/Field Office: Las Vegas Field Office	Date: 11/19/09
Key Observation Point: 2 I-15 near Jean	
Location: taken from a moving car along Highway 15	

SECTION B. CHARACTERISTIC LANDSCAPE DESCRIPTION

	Land/Water	Vegetation	Structures
Form	Flat plain in the foreground, linear and diagonal undulating hill forms in the middle to background	FG: low and shrubby and dispersed creating a low, flat carpet BG: indistinct	Horizontal freeway and barrier wall and linear utility poles in foreground. Horizontal buildings and rectangular road signs in middle to background.
Line	Edge of dry lake creates a straight line in the middleground. In BG, mountain ridges create angular to curvilinear lines	FG and BG: Indistinct	Freeway and barrier wall in FG create straight horizontal lines. utility poles in FG create straight vertical lines In MG and BG, signs and buildings have straight vertical and horizontal lines.
Color	FG: Off-white and brown BG: grayish blues	Medium to brownish green in foreground, brownish gray in middleground and background	Appear grayish from this distance.
Texture	Dry lake bed has smooth texture, vegetated alluvial fan and mountain backdrop have medium texture	Foreground vegetation is medium grained and of medium density. Middle and background vegetation creates a smooth surface.	I-15 has a smooth texture, but utility poles have a coarse texture. Textures of the more distant Primm and power plant are indistinct.

SECTION C. PROPOSED ACTIVITY DESCRIPTION

	Land/Water	Vegetation	Structures
Form	Same	Same	The solar collectors appear as several sets of flat, rectangular forms.
Line	Same	Same	The arrangement of the blocks of solar collectors appears to create a set of straight lines.
Color	Same	Same	From this angle, the collector fields appear to have a dark, grayish tone.
Texture	Same	Same	The collector fields appear to have a medium texture.

SECTION D. CONTRAST RATING ☐ SHORT TERM ☒ LONG TERM

1. Degree of Contrast		Features: Land/Water Body				Vegetation				Structures				2. Does project design meet VRM objectives? ☒ Yes ☐ No (explain on back)
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	3. Additional mitigating measures recommended ☒ Yes ☐ No (explain on back)
Elements	Form				X				X		X			Evaluator's Names: Tom Priestley, MariaElena Conserva Date: 12/4/09
	Line				X				X		x			
	Color				X				X		X			
	Texture				X				X			X		

Comment from item 2.

The existing surrounding environment already includes prominently visible lines created by structural elements in the foreground and middleground of the view. The existing foreground of KOP 2 is dominated by structures including I-15, the highway barrier wall and signs, and a steel-pole transmission line. These existing structures create strong horizontal and vertical lines in the landscape composition. Although the arrangement of the blocks of solar collectors appears to create a set of straight lines, the contrast of these lines with their overall landscape setting is moderate at most in consideration of the strong pattern of horizontal lines created by the Interstate Highway's roadway and the wall in the center median and the myriad of vertical lines created by the tubular steel transmission structures in the foreground and middleground of the view.

See Visual Resources Technical Report (CH2M HILL, 2009) for detailed discussion of analysis.

Additional Measures (See item 3)

As the impact analysis described in the Visual Resources Report indicates, the Project would be consistent with the VRM Class III objectives that the BLM has established for the lands included within the Project area. Because the BLM has requested that the visual changes associated with the Project be minimized, the following mitigation measures have been recommended by the BLM, and NextLight will implement these voluntary measures:

Solar field access ways will be offset at appropriate intervals to minimize the appearance of straight lines within the solar field.

The exterior of the inverter boxes and the exterior of the O&M building should be factory treated with a dull finish and a BLM standard environmental color, such as Yuma Green or Covert Green that will minimize their contrast with the surrounding environment.

A plan will be prepared to revegetate areas disturbed by construction of flood control berms and channel improvements. Berms and channel improvements will be blended into the natural landscape to the extent practical.

SECTION A. PROJECT DESCRIPTION

District/Field Office: Las Vegas Field Office	Date: 11/19/09
Key Observation Point: 3 Roach Lake	
Location: 2237664.986 x 738983.807791	

SECTION B. CHARACTERISTIC LANDSCAPE DESCRIPTION

	Land/Water	Vegetation	Structures
Form	Flat plain in the foreground, jagged peaks in the background	Shrubs in FG are dispersed and have low rounded forms.	Dominant lattice steel transmission towers have lattice forms. Transmission line conductors are linear in form. Power plant appears to be a rectangular cube
Line	Horizontal line where the ground plane meets the base of the mountains.	Vegetation has soft, busy forms.	Transmission towers have fine horizontal, vertical, and diagonal elements. Transmission line conductors create horizontal lines that appear to range from straight to concave. Power plant has straight horizontal and vertical lines.
Color	FG: Off-white and light to dark browns, very light tan, khaki BG: grayish blue	FG: Pale to medium green, olive MG: olive to black	Utility structures and power plant appear to be black.
Texture	Ivanpah Valley floor is smooth. mountains in background are of coarse texture.	Foreground vegetation is coarse grained and of high density. Middle and background vegetation is not visible.	Utility structures and power plant have a coarse texture.

SECTION C. PROPOSED ACTIVITY DESCRIPTION

	Land/Water	Vegetation	Structures
Form	same	Same	Solar collectors appear to have a flat, linear form. O&M building has the form of a rectangular solid. New transmission towers are thin and tubular.
Line	Same	Same	Solar collectors appear to create straight lines at the base of the mountains. O&M building creates straight vertical, horizontal, and diagonal lines. New transmission towers create straight vertical lines.
Color	Same	Same	Solar collector fields appear to be gray to white. O&M building is a dark, grayish green.
Texture	Same	Same	Solar collector fields are medium in texture. O&M building appears to be smooth in texture.

SECTION D. CONTRAST RATING ☐ SHORT TERM ☒ LONG TERM

1. Degree of Contrast		Features: Land/Water Body				Vegetation				Structures				2. Does project design meet VRM objectives? ☒ Yes ☐ No (explain on back)
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	3. Additional mitigating measures recommended ☒ Yes ☐ No (explain on back)
Elements	Form				X				X			X		Evaluator's Names: Mark Chandler, Tom Priestley, Tom Dildine, MariaElena Conserva
	Line				X				X		X			
	Color				X				X		X			
	Texture				X				X			X		Date: 11/19/09

Comment from item 2.

See Visual Resources Technical Report (CH2M HILL, 2009) for detailed discussion of analysis.

Additional Measures (See item 3)

As the impact analysis described in the Visual Resources Report indicates, the Project would be consistent with the VRM Class III objectives that the BLM has established for the lands included within the Project area. Because the BLM has requested that the visual changes associated with the Project be minimized, the following mitigation measures have been recommended by the BLM, and NextLight will implement these voluntary measures:

Solar field access ways will be offset at appropriate intervals to minimize the appearance of straight lines within the solar field.

The exterior of the inverter boxes and the exterior of the O&M building should be factory treated with a dull finish and a BLM standard environmental color, such as Yuma Green or Covert Green that will minimize their contrast with the surrounding environment.

A plan will be prepared to revegetate areas disturbed by construction of flood control berms and channel improvements. Berms and channel improvements will be blended into the natural landscape to the extent practical.

SECTION A. PROJECT DESCRIPTION

District/Field Office: Las Vegas Field Office	Date: 11/19/09
Key Observation Point: 4 Desert Oasis Apartments	
Location: 2237261.50276 x 737399.214039	

SECTION B. CHARACTERISTIC LANDSCAPE DESCRIPTION

	Land/Water	Vegetation	Structures
Form	Flat plain in the foreground, undulating hill forms in the background	Trees in foreground have conical to cylindrical form. More distant vegetation is indistinct.	Structures dominate foreground including rectangular forms of vehicles, trailers, and utility boxes, Vertical structures include light poles and transmission towers.
Line	Mountains have undulating lines.	Tree lines are vertical and horizontal.	Except for tank structures are linear.
Color	Off-white and light to dark browns	Pale to medium green	Gray asphalt, red landscaping rock, white retaining wall, yellow utility box, multiple colors on vehicles
Texture	Ivanpah Valley floor is smooth, mountains in background are of coarse texture.	Trees in parking lot have a coarse texture but are sparsely planted. Middle and background vegetation creates a coarse texture on the surface of the land.	Vehicles, retaining walls, and utility structures have a coarse texture.

SECTION C. PROPOSED ACTIVITY DESCRIPTION

	Land/Water	Vegetation	Structures
Form	same	Same	Solar collector fields appear to create flat, rectangular forms on the alluvial fan. Small inverter structures are cubic in form.
Line	Same	Same	Solar collector fields are formed by straight horizontal and vertical lines. Inverter structures have straight horizontal and vertical lines.
Color	Same	Same	Solar collector fields appear to white to black in color.
Texture	Same	Same	Surfaces of solar collector fields appear medium to coarse. Inverter structures are smooth in texture.

SECTION D. CONTRAST RATING ☐ SHORT TERM ☒ LONG TERM

1. Degree of Contrast		Features												2. Does project design meet VRM objectives? ☒ Yes ☐ No (explain on back)
		Land/Water Body				Vegetation				Structures				
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	3. Additional mitigating measures recommended ☒ Yes ☐ No (explain on back)
Elements	Form				X				X			X		Evaluator's Names: Mark Chandler, Tom Priestley, Tom Dildine, MariaElena Conserva
	Line				X				X			X		
	Color				X				X		X			
	Texture				X				X			X		Date: 11/19/09

Comment from item 2.

See Visual Resources Technical Report (CH2M HILL, 2009) for detailed discussion of analysis.

Additional Measures (See item 3)

As the impact analysis described in the Visual Resources Report indicates, the Project would be consistent with the VRM Class III objectives that the BLM has established for the lands included within the Project area. Because the BLM has requested that the visual changes associated with the Project be minimized, the following mitigation measures have been recommended by the BLM, and NextLight will implement these voluntary measures:

Solar field access ways will be offset at appropriate intervals to minimize the appearance of straight lines within the solar field.

The exterior of the inverter boxes and the exterior of the O&M building should be factory treated with a dull finish and a BLM standard environmental color, such as Yuma Green or Covert Green that will minimize their contrast with the surrounding environment.

A plan will be prepared to revegetate areas disturbed by construction of flood control berms and channel improvements. Berms and channel improvements will be blended into the natural landscape to the extent practical.

SECTION A. PROJECT DESCRIPTION

District/Field Office: Las Vegas Field Office	Date: 11/19/09
Key Observation Point: 5 Primm Valley Resort and Casino	
Location: 2236999.35527 x 737147.562771	

SECTION B. CHARACTERISTIC LANDSCAPE DESCRIPTION

	Land/Water	Vegetation	Structures
Form	FG: area exposed dirt forming a flat surface and sloped berms. Sloping alluvial plain with flat-appearing surface in middleground. Solid, high, jagged mountains in background	indistinct	Flat road surface, tubular light poles, and angular fence posts in foreground. Angular lattice transmission towers in middleground.
Line	Straight horizontal line where the alluvial plain butts up against the base of the mountains. Mountain ridges create angular to curved horizontal lines	Indistinct	Road creates a straight horizontal line. Light poles create straight vertical lines. In middleground, railway berm creates a thin horizontal line.
Color	Areas of exposed earth in foreground are off-white and light to medium browns. Mountains in background are purplish gray.	Vegetation on alluvial fan in middleground appears dark olive to gray in color	Asphalt road is gray. Light poles are gray, ranging from light to dark based on shadowing. Transmission towers appear dark gray
Texture	Ivanpah Valley floor is smooth, mountains in background are of coarse texture.	Middleground vegetation is fairly continuous and of medium texture. Background vegetation is indistinct	Asphalt road appears smooth.

SECTION C. PROPOSED ACTIVITY DESCRIPTION

	Land/Water	Vegetation	Structures
Form	Same	Same	Solar collector fields create flat, geometric forms. Inverter structures appear as small, rectangular forms.
Line	Same	Same	Solar collector fields defined by straight horizontal and diagonal lines. Inverter structures have straight horizontal and vertical lines.
Color	Same	Same	Surfaces of solar collector fields range from white to gray in color. Inverter structures appear grayish in color.
Texture	Same	Same	Surfaces of solar collector field vary from medium to coarse in texture. Surfaces of inverter structures appear smooth.

SECTION D. CONTRAST RATING ☐ SHORT TERM ☒ LONG TERM

1. Degree of Contrast		Features: Land/Water Body				Features: Vegetation				Features: Structures				2. Does project design meet VRM objectives? ☒ Yes ☐ No (explain on back)
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	3. Additional mitigating measures recommended ☒ Yes ☐ No (explain on back)
Elements	Form				X				X			X		Evaluator's Names: Mark Chandler, Tom Priestley, Tom Dildine, MariaElena Conserva
	Line				X				X		X			
	Color				X				X		X			
	Texture				X				X		X			Date: 11/19/09

Comment from item 2.

See Visual Resources Technical Report (CH2M HILL, 2009) for detailed discussion of analysis.

Additional Measures (See item 3)

As the impact analysis described in the Visual Resources Report indicates, the Project would be consistent with the VRM Class III objectives that the BLM has established for the lands included within the Project area. Because the BLM has requested that the visual changes associated with the Project be minimized, the following mitigation measures have been recommended by the BLM, and NextLight will implement these voluntary measures:

Solar field access ways will be offset at appropriate intervals to minimize the appearance of straight lines within the solar field.

The exterior of the inverter boxes and the exterior of the O&M building should be factory treated with a dull finish and a BLM standard environmental color, such as Yuma Green or Covert Green that will minimize their contrast with the surrounding environment.

A plan will be prepared to revegetate areas disturbed by construction of flood control berms and channel improvements. Berms and channel improvements will be blended into the natural landscape to the extent practical.

SECTION A. PROJECT DESCRIPTION

District/Field Office: Las Vegas Field Office	Date: 11/19/09
Key Observation Point: 6 Lucy Gray OHV	
Location: 2244505.09445 x 734414.949687	

SECTION B. CHARACTERISTIC LANDSCAPE DESCRIPTION

	Land/Water	Vegetation	Structures
Form	Sloping alluvial plain in the FG, flat plain with dry lake bed and sharp jagged peaks in the BG.	In FG, shrubs have mostly rounded form. In BG, vegetation is indistinct	FG: No structures BG: Casinos in Primm and power plant – irregular and blocky
Line	Mountains have jagged lines; otherwise lines are indistinct	FG: uniform overlay BG: indistinct.	FG: no structures BG: Pimm creates a line of development; railroad a linear feature
Color	Off-white, light to dark browns, and grays	FG: pale to dark greens, with mix of khakis, browns and yellows BG: brown, grays, and blacks	Whites, red, gray, khakis, black
Texture	Ivanpah Valley floor is smooth, mountains in background are of coarse texture.	FG: Coarse BG: smooth	BG: coarse urban node at Primm

SECTION C. PROPOSED ACTIVITY DESCRIPTION

	Land/Water	Vegetation	Structures
Form	same	Same	Collector fields appear as flat, linear forms. Inverter boxes appear as small rectangular forms.
Line	Same	Same	Edges of collector fields create straight horizontal lines
Color	Same	Same	Surfaces of collector fields vary in color from light and reflective to dark and non-reflective
Texture	Same	Same	Surfaces of collector fields appear coarse and dotted

SECTION D. CONTRAST RATING ☐ SHORT TERM ☒ LONG TERM

1. Degree of Contrast		Features: Land/Water Body				Features: Vegetation				Features: Structures				2. Does project design meet VRM objectives? ☒ Yes ☐ No (explain on back) 3. Additional mitigating measures recommended ☒ Yes ☐ No (explain on back)
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	
Elements	Form				X				X			X		Evaluator's Names: Mark Chandler, Tom Priestley, Tom Dildine, MariaElena Conserva Date: 11/19/09
	Line				X				X			X		
	Color				X				X		X			
	Texture				X				X			X		

SECTION D. (Continued)

Comment from item 2.

See Visual Resources Technical Report (CH2M HILL, 2009) for detailed discussion of analysis.

Additional Measures (See item 3)

As the impact analysis described in the Visual Resources Report indicates, the Project would be consistent with the VRM Class III objectives that the BLM has established for the lands included within the Project area. Because the BLM has requested that the visual changes associated with the Project be minimized, the following mitigation measures have been recommended by the BLM, and NextLight will implement these voluntary measures:

Solar field access ways will be offset at appropriate intervals to minimize the appearance of straight lines within the solar field.

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A plan will be prepared to revegetate areas disturbed by construction of flood control berms and channel improvements. Berms and channel improvements will be blended into the natural landscape to the extent practical.

SECTION A. PROJECT DESCRIPTION

District/Field Office: Las Vegas Field Office	Date: 11/19/09
Key Observation Point: 7 Ivanpah Lake	
Location: 2236491.28094 x 732565.887423	

SECTION B. CHARACTERISTIC LANDSCAPE DESCRIPTION

	Land/Water	Vegetation	Structures
Form	Flat plain in foreground. Flat, sloped alluvial fan in middleground, solid, jagged mountains in background.	Low-growing shrubs have rounded form.	Power plant includes rectangular building and conical stacks. Lattice transmission towers create vertical forms
Line	Horizontal liens at edge of dry lake and edge of alluvial fan at base of mountains. Mountain ridge creates an irregular, angular line	Shrubs form a uniform carpet across the alluvial fan. Lines created where carpet meets edge of dry lake bed and at base of mountain.	Power plant building has straight horizontal and vertical lines. Power plant stacks create straight vertical lines
Color	Dry lake bed: off-white to light brown. Mountains in backdrop grayish blue	Dark olive green	Power plant, stacks, and transmission lines are dark in color. Small areas of white on power pant complex
Texture	Dry lake bed is smooth, mountains in background are of coarse texture.	Continuous and of medium coarseness	Medium texture due to distance

SECTION C. PROPOSED ACTIVITY DESCRIPTION

	Land/Water	Vegetation	Structures
Form	Same	Same	Solar collector fields create low, flat-appearing linear forms
Line	Same	Same	Edges of solar collector fields create straight-appearing parallel horizontal lines contrasting against the vegetated alluvial fan
Color	Same	Same	Surfaces of solar collector fields have a gray appearance
Texture	Same	Same	Surfaces of solar collector fields appear medium-fine in the middle and coarse at the ends

SECTION D. CONTRAST RATING ☐ SHORT TERM ☒ LONG TERM

1. Degree of Contrast		Features: Land/Water Body				Features: Vegetation				Features: Structures				2. Does project design meet VRM objectives? ☒ Yes ☐ No (explain on back)
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	3. Additional mitigating measures recommended ☒ Yes ☐ No (explain on back)
Elements	Form				X				X			X		Evaluator's Names: Mark Chandler, Tom Priestley, Tom Dildine, MariaElena Conserva Date: 11/19/09
	Line				X				X		X			
	Color				X				X		X			
	Texture				X				X			X		

Comment from item 2.

See Visual Resources Technical Report (CH2M HILL. 2009) for detailed discussion of analysis.

Additional Measures (See item 3)

As the impact analysis described in the Visual Resources Report indicates, the Project would be consistent with the VRM Class III objectives that the BLM has established for the lands included within the Project area. Because the BLM has requested that the visual changes associated with the Project be minimized, the following mitigation measures have been recommended by the BLM, and NextLight will implement these voluntary measures:

Solar field access ways will be offset at appropriate intervals to minimize the appearance of straight lines within the solar field.

The exterior of the inverter boxes and the exterior of the O&M building should be factory treated with a dull finish and a BLM standard environmental color, such as Yuma Green or Covert Green that will minimize their contrast with the surrounding environment.

A plan will be prepared to revegetate areas disturbed by construction of flood control berms and channel improvements. Berms and channel improvements will be blended into the natural landscape to the extent practical.

SECTION A. PROJECT DESCRIPTION

District/Field Office: Las Vegas Field Office	Date: 11/19/09
Key Observation Point: 8 I-15 at Nipton Road	
Location: 2231526.97094 x 721841.10411	

SECTION B. CHARACTERISTIC LANDSCAPE DESCRIPTION

	Land/Water	Vegetation	Structures
Form	Flat plain in foreground. Undulating hills in background.	Rounded to indistinct.	Freeway and barrier in foreground have horizontal form. Buildings in Primm and power plant appear as cubes
Line	Mountains have undulating lines.	Indistinct	Freeway and barrier in foreground have horizontal lines. Buildings in Primm and power plant are indistinct.
Color	Off-white and light to dark browns.	Brownish -green.	Whites, browns, grays.
Texture	Ivanpah Valley floor is smooth, mountains in background are of coarse texture.	Continuous and of medium texture.	Primm, power plant, and utility poles are of medium texture.

SECTION C. PROPOSED ACTIVITY DESCRIPTION

	Land/Water	Vegetation	Structures
Form	Same	Same	Solar collector fields create low, flat, angular forms similar to dry lakebeds
Line	Same	Same	Edges of solar collector fields create distinct, straight-appearing horizontal and diagonal lines. Lines are pronounced because of color differences between structures and vegetated areas. In closest collector field, inverter boxes create an appearance of a repeated series of lines.
Color	Same	Same	Surfaces of solar collector fields have a gray appearance, repeating road colors but different from color of power plant and buildings in Primm
Texture	Same	Same	Surfaces of closest solar collector fields appear dotted and ordered. More distant fields appear smooth and indistinct

SECTION D. CONTRAST RATING ☐ SHORT TERM ☒ LONG TERM

1. Degree of Contrast		Features: Land/Water Body				Features: Vegetation				Features: Structures				2. Does project design meet VRM objectives? ☒ Yes ☐ No (explain on back)
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	3. Additional mitigating measures recommended ☒ Yes ☐ No (explain on back)
Elements	Form				X				X		X			Evaluator's Names: Mark Chandler, Tom Priestley, Tom Dildine, MariaElena Conserva
	Line				X				X		X			
	Color				X				X		X			
	Texture				X				X			X		Date: 11/19/09

Comment from item 2.

See Visual Resources Technical Report (CH2M HILL, 2009) for detailed discussion of analysis.

Additional Measures (See item 3)

As the impact analysis described in the Visual Resources Report indicates, the Project would be consistent with the VRM Class III objectives that the BLM has established for the lands included within the Project area. Because the BLM has requested that the visual changes associated with the Project be minimized, the following mitigation measures have been recommended by the BLM, and NextLight will implement these voluntary measures:

Solar field access ways will be offset at appropriate intervals to minimize the appearance of straight lines within the solar field.

The exterior of the inverter boxes and the exterior of the O&M building should be factory treated with a dull finish and a BLM standard environmental color, such as Yuma Green or Covert Green that will minimize their contrast with the surrounding environment.

A plan will be prepared to revegetate areas disturbed by construction of flood control berms and channel improvements. Berms and channel improvements will be blended into the natural landscape to the extent practical.

SECTION A. PROJECT DESCRIPTION

District/Field Office: Las Vegas Field Office	Date: 11/19/09
Key Observation Point: 9 Mojave National Preserve Entrance	
Location: 2236937.68048 x 720272.198522	

SECTION B. CHARACTERISTIC LANDSCAPE DESCRIPTION

	Land/Water	Vegetation	Structures
Form	Flat plain in foreground. Undulating hills in background.	Rounded and inverted conical forms.	Road is horizontal. Signs are linear.
Line	Mountains have undulating lines.	Vegetation has diagonal linear quality.	Road is horizontal. Signs are linear.
Color	Off-white and light to dark browns.	Medium to dark greens.	Gray, orange, red, and green.
Texture	Ivanpah Valley floor is smooth, mountains in background are of medium texture.	Continuous and of medium texture.	Road signs are of moderate texture.

SECTION C. PROPOSED ACTIVITY DESCRIPTION

	Land/Water	Vegetation	Structures
Form	Same	Same	Solar collector fields create low, flat-appearing angular forms
Line	Same	Same	Edges of solar collector fields create straight-appearing horizontal and angular lines
Color	Same	Same	Surfaces of solar collector fields have a gray matte appearance
Texture	Same	Same	Surfaces of solar collector fields appear indistinct to smooth

SECTION D. CONTRAST RATING ☐ SHORT TERM ☒ LONG TERM

1. Degree of Contrast		Features: Land/Water Body				Vegetation				Structures				2. Does project design meet VRM objectives? ☒ Yes ☐ No (explain on back)
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	3. Additional mitigating measures recommended ☒ Yes ☐ No (explain on back)
Elements	Form				X				X			X		Evaluator's Names: Mark Chandler, Tom Priestley, Tom Dildine, MariaElena Conserva Date: 11/19/09
	Line				X				X		X			
	Color				X				X		X			
	Texture				X				X			X		

SECTION D. (Continued)

Comment from item 2.

See Visual Resources Technical Report (CH2M HILL, 2009) for detailed discussion of analysis.

Additional Measures (See item 3)

As the impact analysis described in the Visual Resources Report indicates, the Project would be consistent with the VRM Class III objectives that the BLM has established for the lands included within the Project area. Because the BLM has requested that the visual changes associated with the Project be minimized, the following mitigation measures have been recommended by the BLM, and NextLight will implement these voluntary measures:

Solar field access ways will be offset at appropriate intervals to minimize the appearance of straight lines within the solar field.

The exterior of the inverter boxes and the exterior of the O&M building should be factory treated with a dull finish and a BLM standard environmental color, such as Yuma Green or Covert Green that will minimize their contrast with the surrounding environment.

A plan will be prepared to revegetate areas disturbed by construction of flood control berms and channel improvements. Berms and channel improvements will be blended into the natural landscape to the extent practical.

D Conceptual Drainage Study

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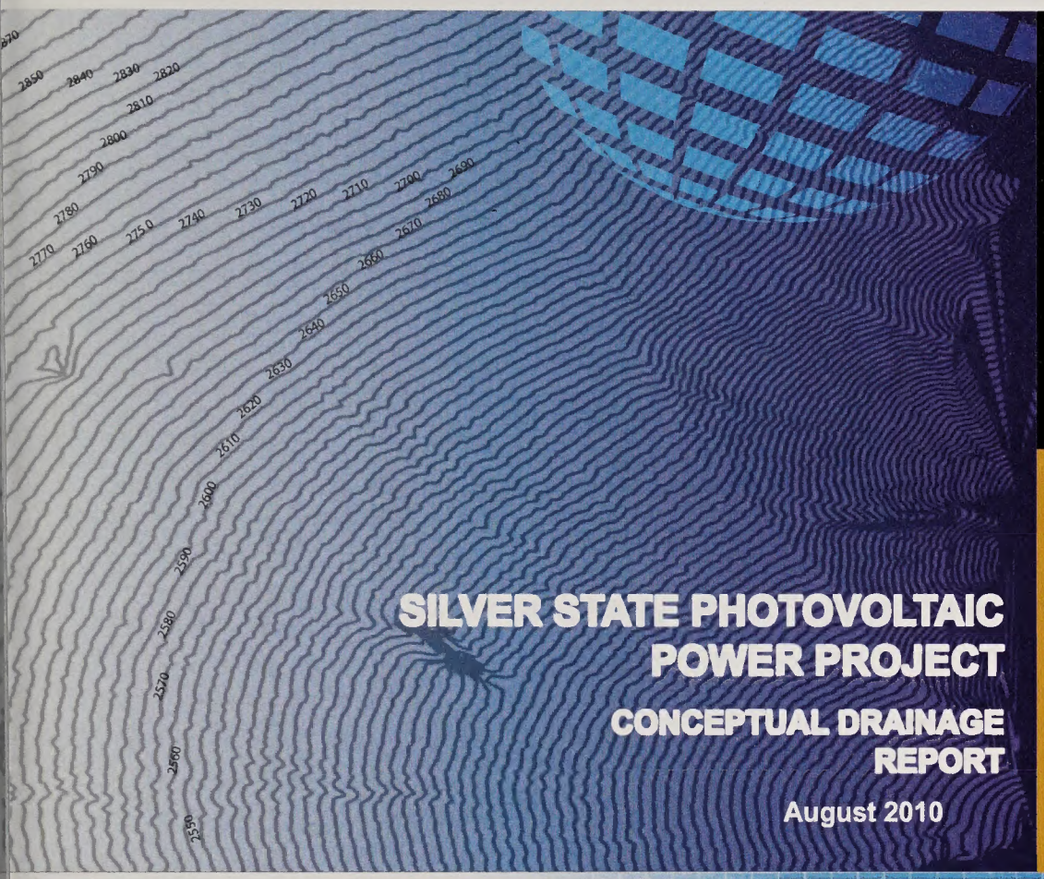
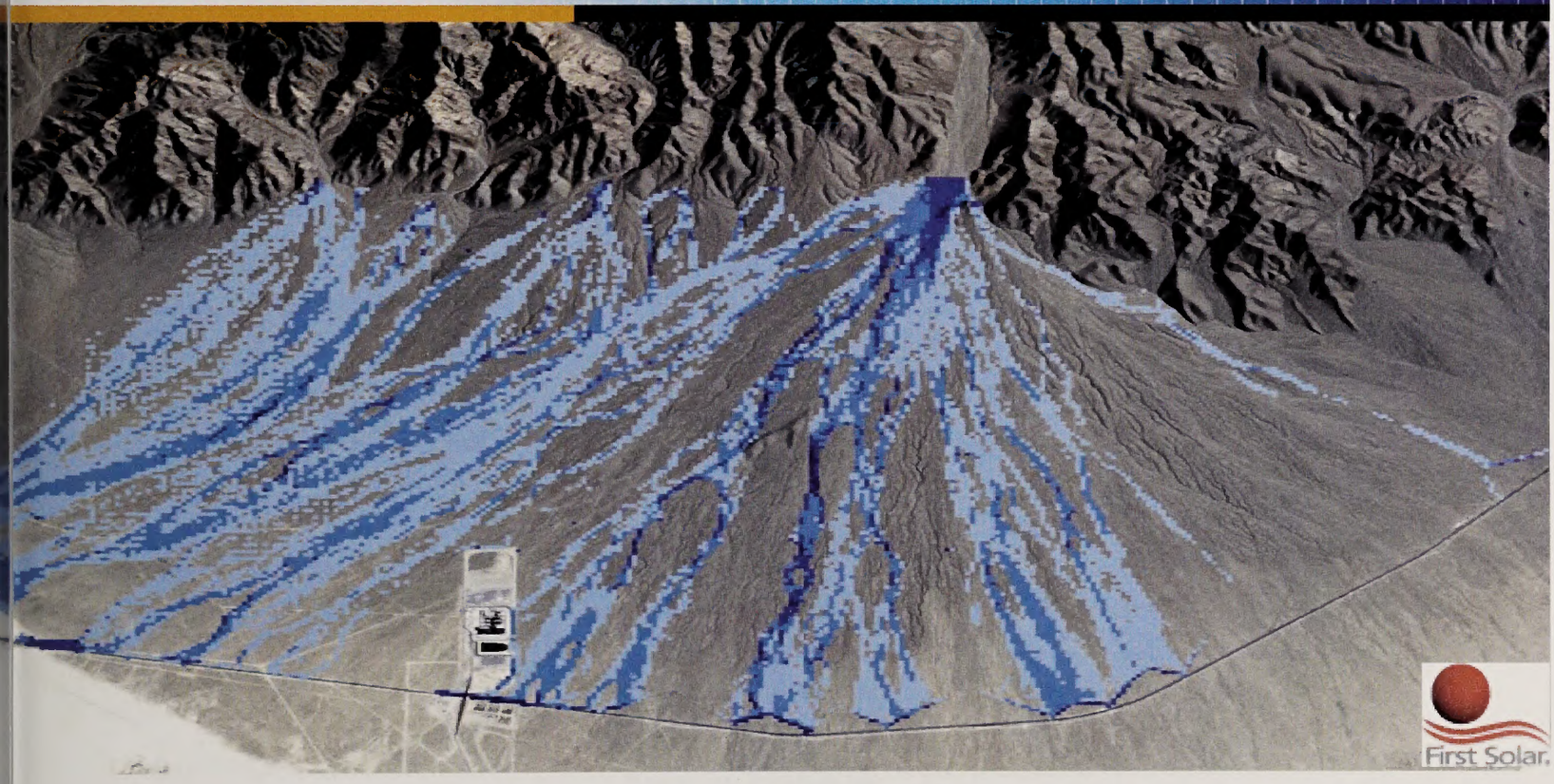


SILVER STATE PHOTOVOLTAIC POWER PROJECT

CONCEPTUAL DRAINAGE REPORT

August 2010

THE Louis Berger Group, INC.



Conceptual Drainage Report

SILVER STATE PHOTOVOLTAIC POWER PROJECT

Prepared for:

First Solar. Inc.
350 West Washington, Suite 600
Tempe, AZ 85281

by:

THE Louis Berger Group, INC.
500 E. Amigo Court, Suite 100
Las Vegas, NV 89119

AUGUST 9, 2010
(Revised)

TABLE OF CONTENTS

EXECUTIVE SUMMARY **1**

1.0 INTRODUCTION **1**
1.1 Project Location 1
1.2 Proposed Development 1

2.0 PREVIOUS STUDIES **7**
2.1 Flood Control Facilities Master Plan Update 7
2.2 Flood Insurance Rate Maps 7
2.3 Silver State Project Reports 11

3.0 HYDROLOGIC AND HYDRAULIC ANALYSIS **13**
3.1 Modeling Method 13
3.2 Drainage Basins 14
3.3 Precipitation 14
3.3.1 Design Storm 14
3.3.2 Storm Distribution Number (SDN) 15
3.4 Time of Concentration and Lag Time 15
3.5 Soil Group and Curve Numbers 16
3.6 FAN Geomorphology 18
3.7 Other FLO-2D Input 20
3.7.1 Digital Terrain Model 20
3.7.2 Grid Size and Nodes 20
3.7.3 Flow Reduction Factor 20
3.7.4 Hydraulic Resistance Factor (Manning's n) 20

4.0 HYDROLOGIC AND HYDRAULIC MODEL RESULTS **21**
4.1 Mountain Area HEC-1 Model Results 21
4.2 FLO-2D Results – Pre-Development Conditions 21
4.2.1 Northern Mountain Basin Storm Event 27
4.2.2 Southern Mountain Basins Storm Event 28
4.3 FLO-2D Results – Post-Development Conditions 28

5.0 SCOUR ANALYSIS **33**
5.1 Scour Protection of Berms 33
5.2 Scour at PV Panel Foundation 36

6.0 CONCLUSIONS **38**

7.0 REFERENCES **39**

APPENDICES

APPENDIX A HYDROLOGIC PARAMETERS AND ANALYSIS

A.1 Precipitation

Figure A.1.1 Precipitation Map

A.2 Lag Time Calculations

Table A.2.1 Standard Form 4 – Lag Time Calculations for Basins Less Than One Square Mile in Area
Table A.2.2 Column Calculation Explanations for Table A.2.1
Table A.2.3 Lag Time Calculations - USBR Method for Basins Greater Than One Square Mile in Area

A.3 Curve Number Calculations

A.4 HEC-1 Model Output – 100-year, 6-hour Event

A.4.1 Northern Mountain Basins (SDN3)
A.4.2 Southern Mountain Basin (SDN5)

APPENDIX B CONCEPTUAL CONTOUR PLAN

APPENDIX C DATA CD

LIST OF FIGURES

		Page
Figure 1.1	Vicinity Map	2
Figure 1.2	Conceptual Site Plan	3
Figure 1.3	Topographic Map showing Post-Development Flow Patterns	(insert) 4
Figure 1.4	Typical PV Panel Arrangement	6
Figure 2.1	Flood Control Facilities Master Plan	8
Figure 2.2a	Flood Insurance Rate Map (Panel 3325)	9
Figure 2.2b	Flood Insurance Rate Map (Panel 3500)	10
Figure 2.3	Waters of the U.S.	12
Figure 3.1	Mountain Areas Soils Map	17
Figure 3.2	Surficial Geologic Map	19
Figure 4.1	Mountain Areas Flow Map	22
Figure 4.2	Northern Fan Pre-Development Flow Map	(insert) 23
Figure 4.3	Northern Fan Pre-Development Velocity Map	24
Figure 4.4	Southern Fan Pre-Development Flow Map	(insert) 25
Figure 4.5	Southern Fan Pre-Development Velocity Map	26
Figure 4.6	Northern Fan Post-Development Flow Map	(insert) 29
Figure 4.7	Northern Fan Post-Development Velocity Map	30
Figure 4.8	Southern Fan Post-Development Flow Map	(insert) 31
Figure 4.9	Southern Fan Post-Development Velocity Map	32
Figure 5.1	Typical Riprap Berm Section	34

LIST OF TABLES

Table 3.1	Rainfall Depth	15
Table 3.2	Cover Type - CN values for Soil Groups	16
Table 3.3	Weighted CN Values	18
Table 4.1	Apex Flow Rates for Storm Centers	21
Table 5.1	Riprap Sizing for Berms	33
Table 5.2	Toe Scour at Berms	35
Table 5.3	PV Panel Foundation Scour Calculations	37

EXECUTIVE SUMMARY

The Silver State Photovoltaic Power Project is proposed to be constructed on a series of alluvial fans located at the base of the Lucy Gray Mountains near Primm, Nevada. Alluvial fans are defined as "sedimentary deposits located at a topographic break, such as the base of a mountain, escarpment, or valley side, that is composed of stream flow and/or debris flow sediments that has the shape of a fan either fully or partially extended. Active flood areas of an alluvial fan are generally characterized unstable with uncertain flow paths. This type of flooding usually creates a single channel at the apex, but splits into multiple channels as it travels down the fan. These channels are subject to deposition and bank or bottom erosion that cause channel migration, avulsion (sudden change in flow direction), and the formation of new channels.

This report presents a hydrologic and hydraulic assessment of the alluvial fans at project site under pre- and post-development conditions. Hydrologic and hydraulic models were prepared to quantify the 100-year flood flows emanating from the mountains onto the alluvial fans and evaluate potential flood paths, flow depth and velocity on the fan surface. Development of the models, including methods and assumptions, is discussed in detail in Section 3 of this report.

From the model results, areas of high risk of alluvial fan flooding were identified. Four high risk flow "corridors" were designated to be set aside for the sole purpose of flow conveyance, where PV panels will not be constructed. At selected locations, optional berms were proposed to preserve and prevent flow from breaking out of the designated high risk corridor. Where PV panels are proposed to be constructed in areas of high risk outside of the designated flow corridors, special consideration will be required to ensure that solar panels and equipment are elevated above the flood depth. Section 4 of this report presents the results of the hydrologic and hydraulic modeling.

Lastly, an analysis was conducted to estimate potential depth of local scour at the berms and PV panels. It was determined that scour at the berms could be expected with the scour depth ranging from 0.7 feet to 3 feet depending on the direction of flow. Berms should be lined with riprap to protect against potential scour and the riprap should extend below the flow line of the natural wash to the anticipated depth of scour. In addition, it was determined that the scour depth at a concrete ballast foundation would be 2.75 times that of a steel post. Therefore, it was recommended that concrete ballasts not be used in areas where flooding is expected to occur. Section 5 presents the results of the scour analysis.

1.0 INTRODUCTION

1.1 Project Location

First Solar, Inc. proposes to construct and operate the Silver State Photovoltaic (PV) Power Project (Silver State Project) approximately 2 miles east of Primm, Nevada (see Figure 1.1). Primm is a resort designation located in the Ivanpah Valley approximately 40 miles southwest of Las Vegas, Nevada on the Nevada/California state line. The project is located on land in unincorporated Clark County that is administered by the Department of the Interior, Bureau of land Management (BLM).

1.2 Proposed Development

The Silver State Project boundary encompasses 7,825 acres of which 2,900 acres will be developed for solar energy generation (see Figure 1.2). The Silver State Project will produce a 400-megawatt (MW) of power – enough electricity to power 120,000 homes.

Four high risk flow "corridors" were designated to be set aside for the sole purpose of flow conveyance, where PV panels will not be constructed. At selected locations, optional berms were proposed to preserve and prevent flow from breaking out of the designated high risk corridor. Figure 1.3 is a topographic map, showing areas (in blue) where flooding is most likely to occur during a 100-year storm event. Details regarding the flood prone areas are discussed in further detail in Section 4 of this report.

Figure 1.4 presents an example of one type of PV technology proposed to be installed at the site. Other technologies may also be used depending on cost and market availability on the equipment. The PV modules will be mounted and arranged into east to west-oriented rows throughout the site. For each block of modules, a direct current (DC) to alternating current (AC) power inverter will be mounted on a concrete pad near a service accessway. Special consideration will be required during construction to ensure that solar panels and equipment are elevated above the flood depth in these areas.

Important features of the PV panels, from a flooding standpoint, are the height of the panel above the ground, the type of foundation, and the burial depth of the electric cables. The lowest point on the units is approximately 12 inches minimum above the ground, though areas with flow depths exceeding 6 inches will be built higher accordingly. Foundations may be either concrete ballasts or embedded steel posts. Electric cables are typically buried in a 3 foot deep trench.

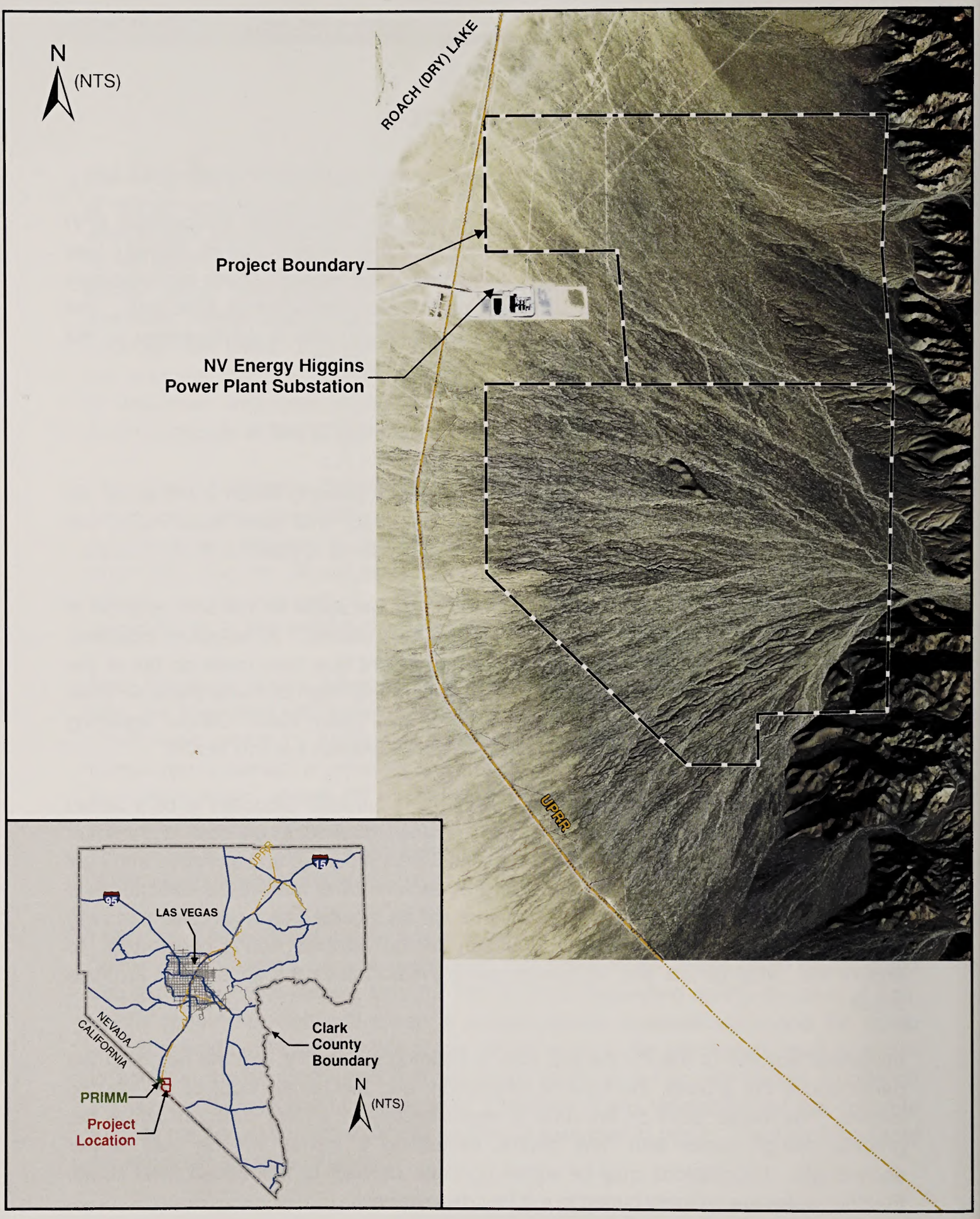
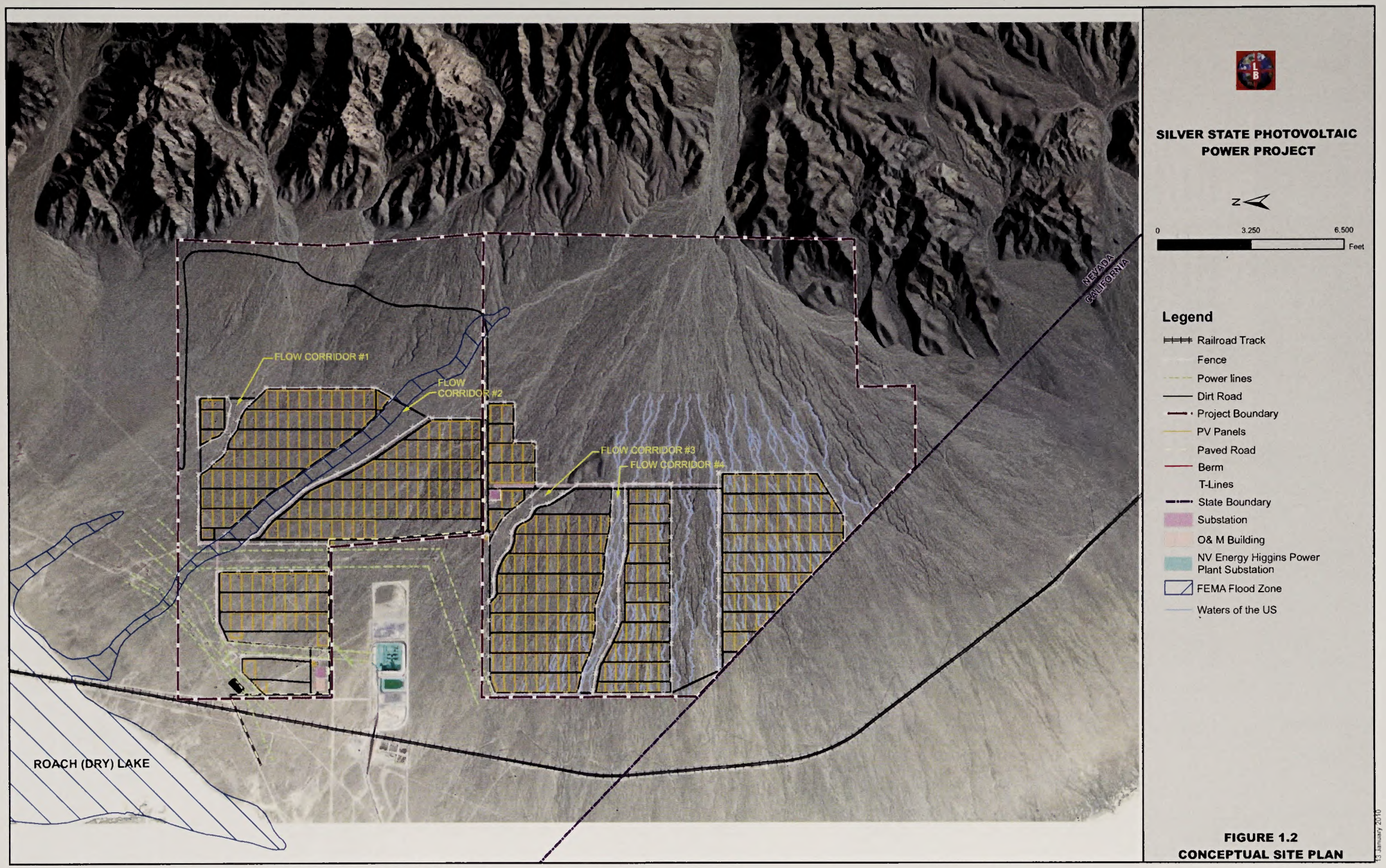


FIGURE 1.1
VICINITY MAP



SILVER STATE PHOTOVOLTAIC POWER PROJECT

N

0 3,250 6,500 Feet

Legend

- Railroad Track
- Fence
- Power lines
- Dirt Road
- Project Boundary
- PV Panels
- Paved Road
- Berm
- T-Lines
- State Boundary
- Substation
- O& M Building
- NV Energy Higgins Power Plant Substation
- FEMA Flood Zone
- Waters of the US

FIGURE 1.2
CONCEPTUAL SITE PLAN

15 January 2010

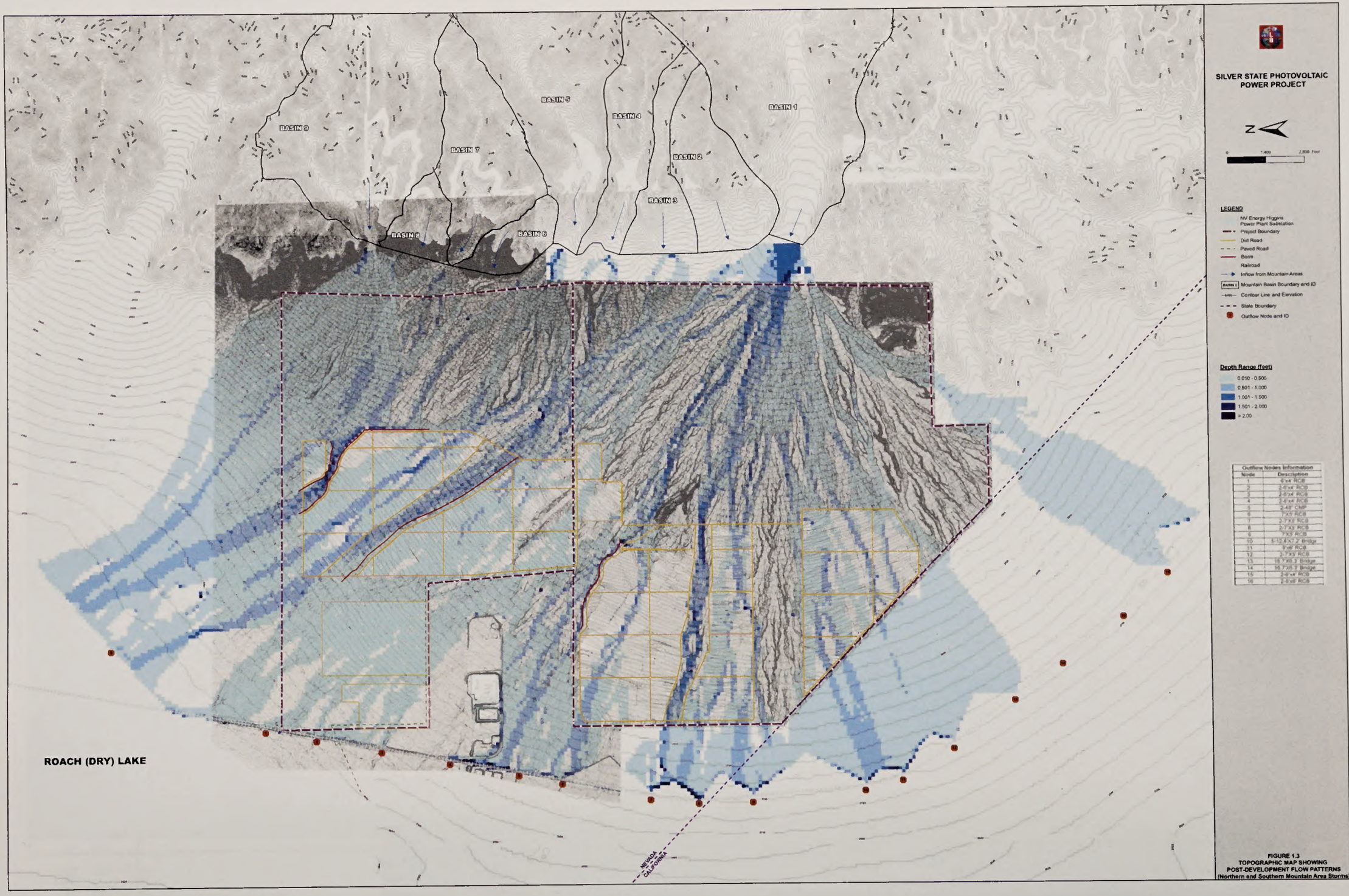
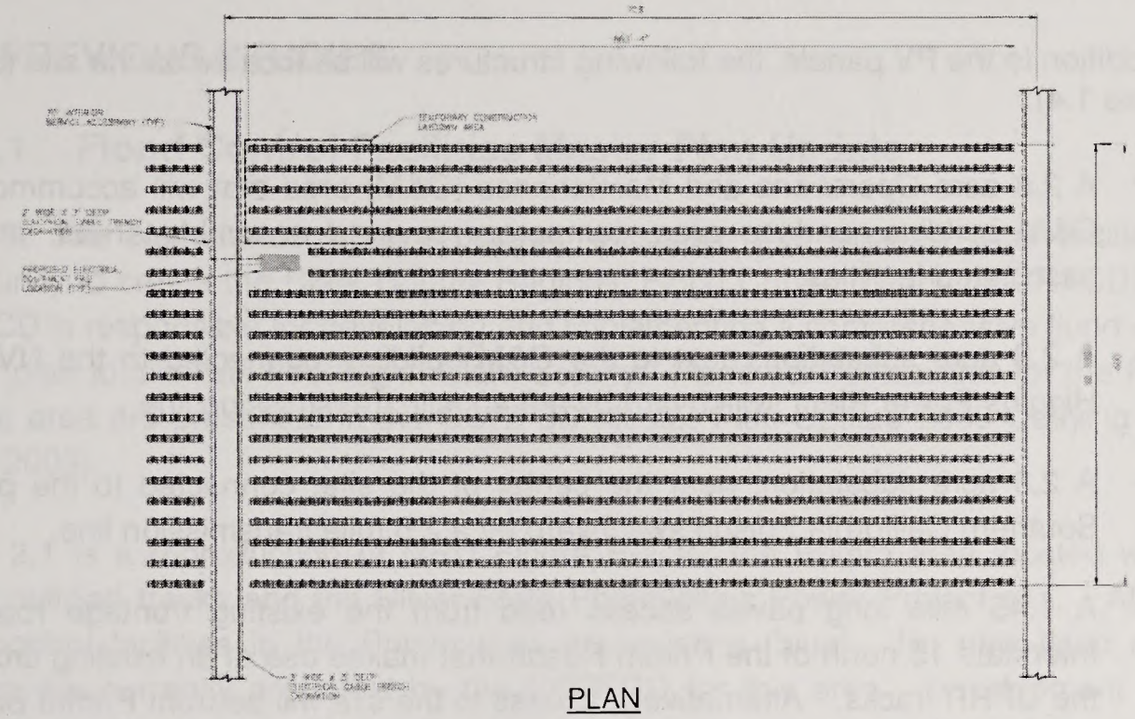
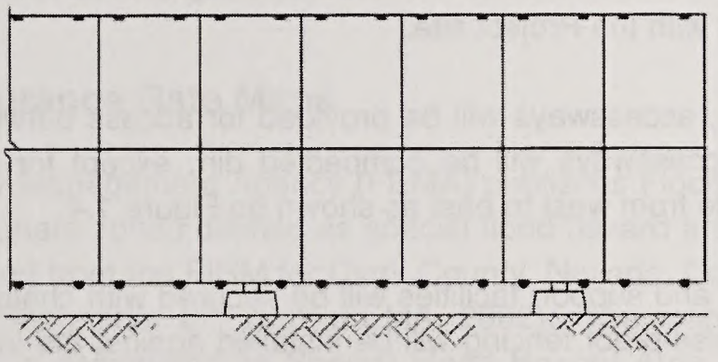


FIGURE 1.3
TOPOGRAPHIC MAP SHOWING POST-DEVELOPMENT FLOW PATTERNS (Northern and Southern Mountain Area Storms)

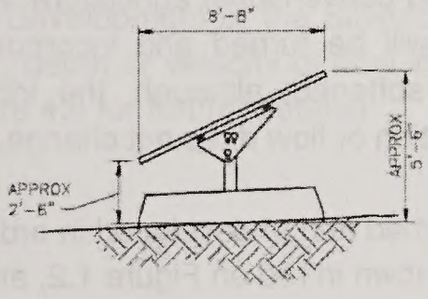
January 14, 2010



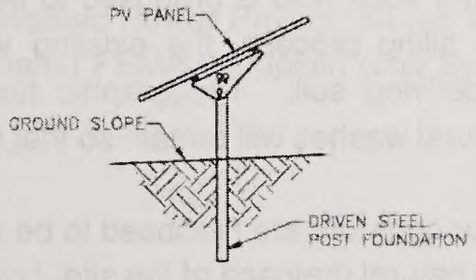
PLAN



ELEVATION (WEST- EAST)



CONCRETE BALLAST FOUNDATION



STEEL POST FOUNDATION

ELEVATION (SOUTH - NORTH)

BLACK & VEATCH CORPORATION

FIGURE 1.4
TYPICAL PV PANEL ARRANGEMENT

12 January 2010

In addition to the PV panels, the following structures will be located on the site (see Figure 1.4):

- A 2.8 acre Operations and Maintenance (O&M) area that will accommodate an O&M building, parking area, temporary covered assembly areas, and other associated facilities.
- A 2.8 acre substation, next to the O&M building, connected to the NV Energy Higgins Power Plant switchyard by a 0.40 mile transmission line.
- A 2.8 acre substation, near the center of the site, connected to the proposed Southern California Edison switchyard by a 2.5 mile transmission line.
- A 1.45 mile long paved access road from the existing frontage road along Interstate 15 north of the Primm Resort that makes use of an existing crossing of the UPRR tracks. Alternatively, access to the site will be from Primm Boulevard and will use the existing UPRR overpass that provides access to the NV Energy Higgins Power Plant. A new 0.3 mile long access road would be constructed to connect with the Project site.

Within the site, accessways will be provided for access between blocks of PV panels. The service accessways will be compacted dirt, except for one paved road that will traverse the site from west to east as shown on Figure 1.4.

The solar field and support facilities will be secured with chain link metal fabric security fencing. Tortoise-proof fencing will be installed against the lower two feet of the chain link fence.

To facilitate installation and maintenance of the solar panels, the ground within the limits of the solar field is proposed to be tilled using conventional agricultural equipment. In the tilling process, the existing vegetation will be turned and incorporated into the underlying soil. Topographic features will softened; although, the locations of the natural washes will remain so that the distribution of flow does not change.

Four corridors are proposed to be left undisturbed and undeveloped in order to preserve the natural drainage of the site. Low berms, shown in red on Figure 1.2, are proposed to be constructed in some cases along the boundaries of the flow corridors to secure the banks, prevent flow from breaking out into the solar field, and preserve the flow corridors. The berms are optional and do not affect the results or conclusions of the study. A goal of the project development will be to perpetuate the natural drainage patterns at the site.

2.0 PREVIOUS STUDIES

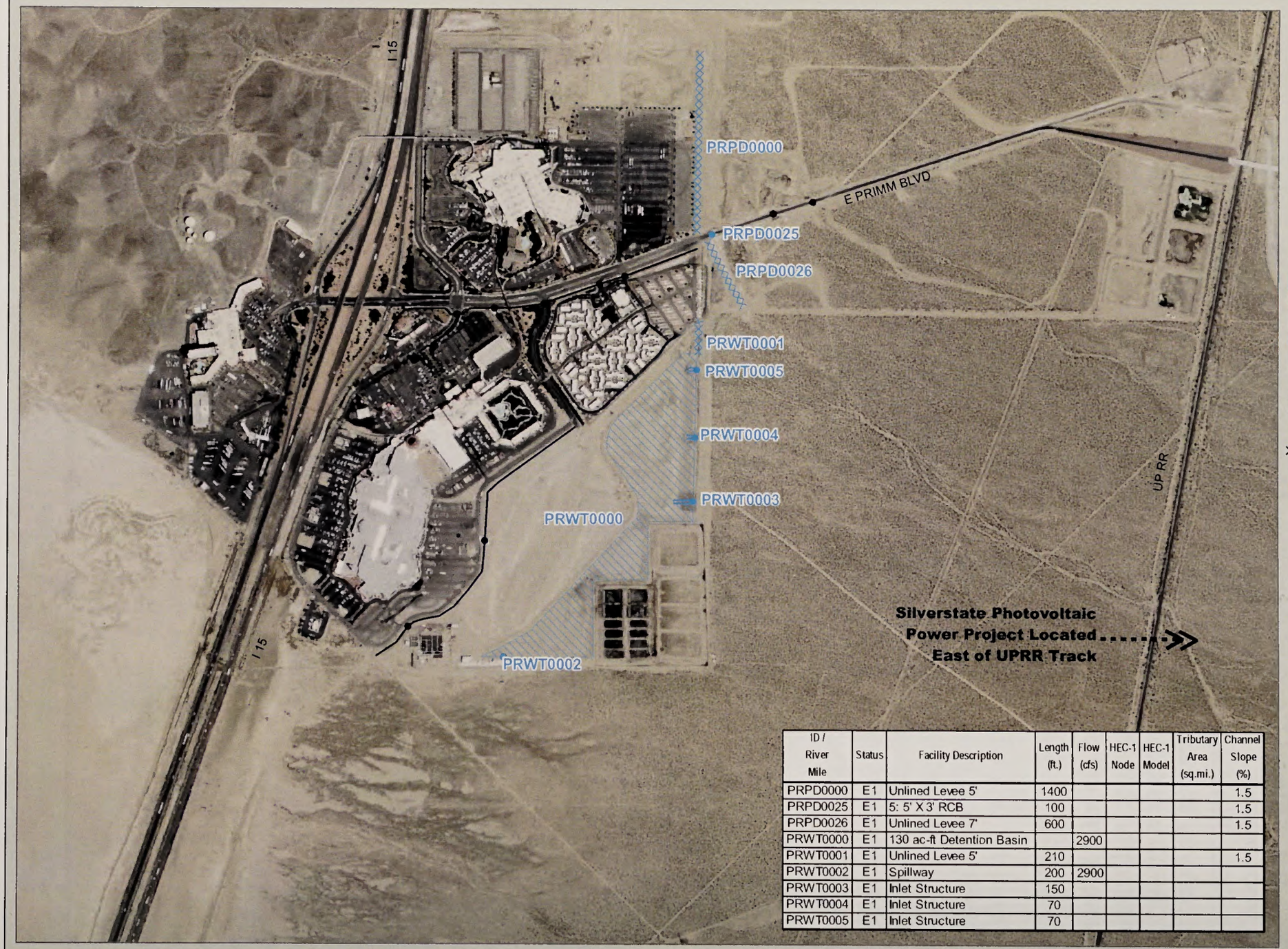
2.1 Flood Control Facilities Master Plan Update

In 1985, The Nevada Legislature passed legislation that allowed local entities the opportunity to create the Clark County Regional Flood Control District (CCRFCD). The CCRFCD is responsible for developing and implementing a comprehensive flood control master plan to alleviate flooding in Clark County. Flood control facilities for the Primm, Nevada area are presented in the CCRFCD Master Plan Update 2009 Outlying Areas (MPU, 2009).

Figure 2.1 is a reproduction of MPU Figure E-2 for the Primm area located west of UPRR railroad tracks and the Silver State Photovoltaic Power Project site. All MPU flood control facilities in the Primm area are existing (blue). No new flood control facilities are currently proposed by the CCRFCD for this area. Development of the Silver State Photovoltaic Power Project will not affect the operation of the existing drainage facilities.

2.2 Flood Insurance Rate Maps

The Federal Emergency Management Agency (FEMA) publishes Flood Insurance Rate Maps (FIRMs) that designate zones defined as special flood hazard areas. Figure 2.2a and 2.2b were reproduced from the FIRM for Clark County, Nevada, Community Panels 3325 and 3500, dated September 27, 2002 (FEMA, 2002). The maps depict a wash through the project that is designated as Special Flood Hazard Area (SFHA) Zone A. SFHA Zone A which is defined as an area subject to 100-year flooding, delineated by approximate method, with no base flood elevations determined. The flow rates and supporting documentation on which the SFHA Zone A is based were not available for this study. Development of the Silver State Photovoltaic Power Project will not affect the flow rate, depth or velocity of flow in the designated FEMA floodplain (see Section 4.3 and Figure 4.8 for further details).



ID / River Mile	Status	Facility Description	Length (ft.)	Flow (cfs)	HEC-1 Node	HEC-1 Model	Tributary Area (sq.mi.)	Channel Slope (%)
PRPD0000	E1	Unlined Levee 5'	1400					1.5
PRPD0025	E1	5: 5' X 3' RCB	100					1.5
PRPD0026	E1	Unlined Levee 7'	600					1.5
PRWT0000	E1	130 ac-ft Detention Basin		2900				
PRWT0001	E1	Unlined Levee 5'	210					1.5
PRWT0002	E1	Spillway	200	2900				
PRWT0003	E1	Inlet Structure	150					
PRWT0004	E1	Inlet Structure	70					
PRWT0005	E1	Inlet Structure	70					

REGIONAL FLOOD CONTROL DISTRICT

2009
OUTLYING AREA
FLOOD CONTROL
MASTER PLAN UPDATE

FIGURE E-2
PRIMM

FLOOD CONTROL FACILITIES

LEGEND

- Existing Facilities
- Category A Proposed Facilities
- Local Existing Facilities
- Local Proposed Facilities
- Detention Basin
- Culvert or Bridge Crossing
- Stormdrain
- Lined Channel
- = Unlined Channel
- Levee/Dike
- Natural Wash/Floodway
- ID-Mile Separator

Note:

Silver State Photovoltaic Power Project is located East of the railroad and it is not shown on this map.

N
W E
S

0 175 350 700 1,050
Feet

Scale: 1 inch = 700 feet

G. C. WALLACE COMPANIES
ENGINEERS | PLANNERS | SURVEYORS

FIGURE 2.1

NOTES TO USERS

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. The **community map repository** should be consulted for possible updated or additional flood hazard information.

To obtain more detailed information in areas where **Base Flood Elevation (BFEs)** and/or **floodways** have been determined, users are encouraged to consult the Flood Profiles and Floodway Data tables contained within the Flood Insurance Study (FIS) report that accompanies this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded whole-foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

Coastal Base Flood Elevation (BFEs) shown on this map apply only landward of 0.0° North American Vertical Datum (NAVD). Users of this FIRM should be aware that coastal flood elevations may also be provided in the Summary of Stillwater Elevations table in the Flood Insurance Study report for this community. Elevations shown in the Summary of Stillwater Elevations table should be used for construction, and/or floodplain management purposes when they are higher than the elevations shown on this FIRM.

Boundaries of the **floodways** were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study report for this jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by **flood control structures.** Refer to Section 2.4 "Flood Protection Measures" of the Flood Insurance Study report for information on flood control structures in this jurisdiction.

The **projection** used in the preparation of this map is Universal Trenverse Mercator (UTM) Zone 11. The **horizontal** datum is NAD83, GRS1980 spheroid. Differences in datum, spheroid, projection or UTM zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of the FIRM.

Flood elevations on this map are referenced to the North American Vertical Datum of 1988. These flood elevations must be compared to structure and ground elevations referenced to the same **vertical datum.** For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at www.ngs.noaa.gov or contact the National Geodetic Survey at the following address:

Vertical Network Branch, N/CG13
National Geodetic Survey, NOAA
Silver Spring Metro Center 3
1315 East-West Highway
Silver Spring, Maryland 20910
(301) 713-3191

To obtain current elevation, description, and/or location information for **bench marks** shown on this map, please contact the information Services Branch of the National Geodetic Survey at **(301) 713-3242**, or visit their website at www.ngs.noaa.gov.

Base map information shown on this FIRM was provided in digital format by Clark County Regional Flood Control District. This information was converted using Orthophotography, dated 1999 or newer, and GBF/DIME data. Segments were digitized off of the orthoimtiography based on center of pavement.

Corporate limits shown on this map are based on the best data available at the time of publication. Because changes due to annexations or de-annexations may have occurred after this map was published, map users should contact appropriate community officials to verify current corporate limit locations.

Please refer to the separately printed **Map Index** for an overview map of the county showing the layout of map panels; community map repository addresses; and a Listing of Communities table containing National Flood Insurance Program dates for each community as well as a listing of the panels on which each community is located.

An accompanying Flood Insurance Study report, Letters of Map Revision or Letters of Map Amendment revising portions of this panel, and digital versions of this PANEL may be available. Contact the **FEMA Map Service Center** at the following phone numbers and Internet address for information on all related products available from FEMA:

Phone: 800-358-9616
FAX: 800-358-9620
www.fema.gov/mac

If you have **questions about this map** or questions concerning the National Flood Insurance Program in general, please call **1-877-FEMA-MAP** (1-877-336-2627) or visit the FEMA website at www.fema.gov.

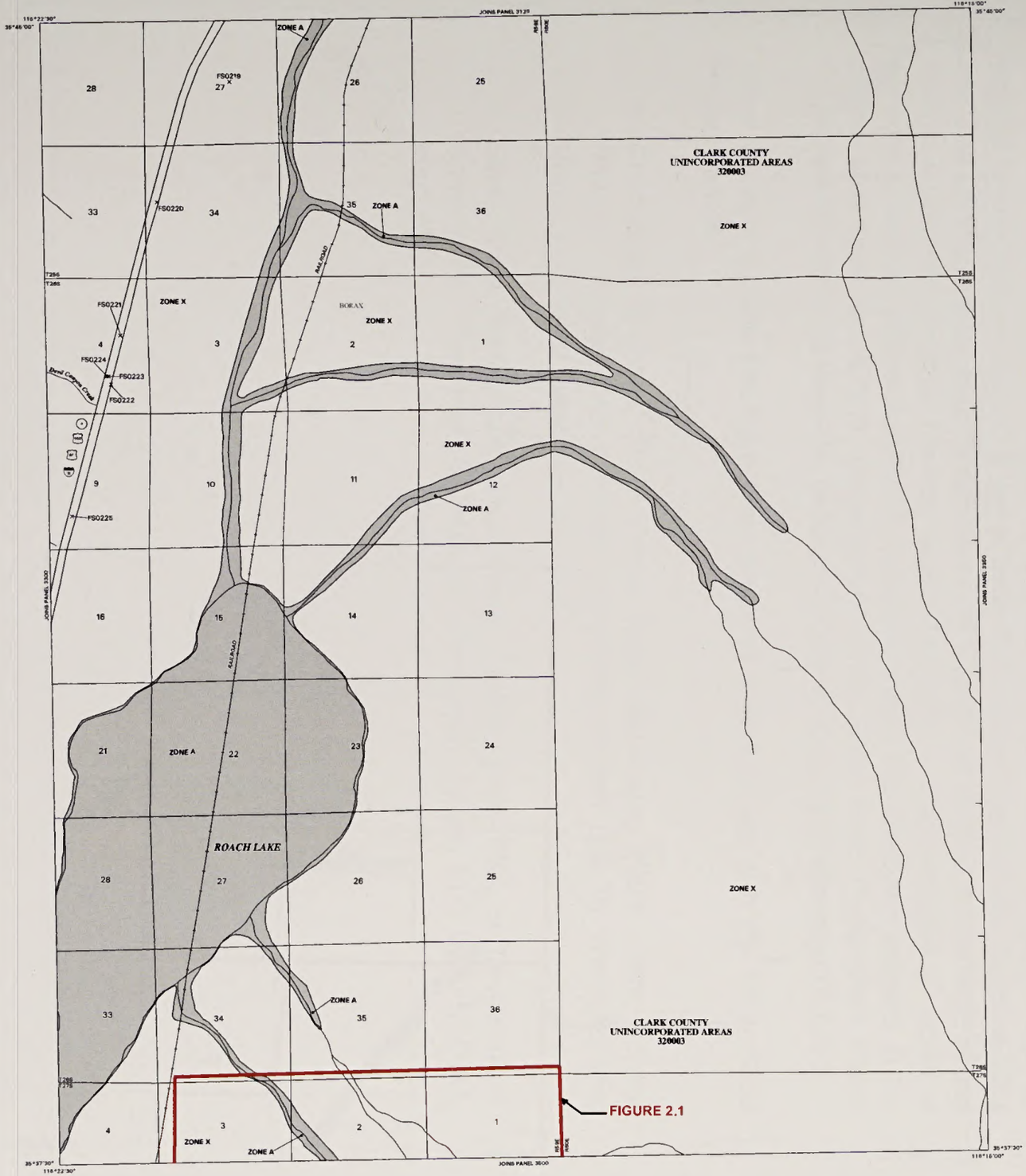
This map reflects more detailed and up-to-date stream channel configurations than those shown on the previous FIRM for this jurisdiction. The floodplains and floodways that were transferred from the previous FIRM may have been adjusted to conform to these new stream channel configurations. As a result, the Flood Profiles and Floodway Data tables in the Flood Insurance Study report may reflect stream channel distances that differ from what is shown on this map.

This Digital Flood Insurance Rate Map (DFIRM) was produced through a unique partnership between Clark County and the Federal Emergency Management Agency (FEMA). Clark County has developed a long-term approach of floodplain management to decrease the costs associated with flooding. This is demonstrated by the Clark County commitment to share and maintain floodplain layers within their Geographic Information System Management Office (GISMO).

This DFIRM reflects several innovative features. These include:
+ Southern Nevada GIS--Cooperation among local governmental agencies throughout Clark County. The foundation of cooperation is the GIS Interlocal Agreements formed between fourteen regional participants. In part, the agreements specify that the Clark County GIS Management Office (GISMO) will be responsible for maintaining a GIS data warehouse and associated Southern Nevada GIS Metadata.

+ The GISMO's responsibilities go beyond maintaining the GIS data warehouse. GISMO also maintains the Street Centerline Database used by 911 dispatch services. This centerline database serves as the base map for this DFIRM.

DIGITAL DATA AVAILABILITY: http://www.co.clark.nv.us/cait/gisma/gismo.htm



Note:

LEGEND

SPECIAL FLOOD HAZARD AREAS SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD EVENT

The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V, and VE. The Base Flood Elevation is the water surface elevation of the 1% annual chance flood.

ZONE A No base flood elevations determined.

ZONE AE Base flood elevations determined.

ZONE AH Flood depths of 1 to 3 feet (usually areas of ponding); base flood elevations determined.

ZONE AO Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.

ZONE AR Area of special flood hazard formerly protected from the 1% annual chance flood event by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood event.

ZONE A99 Area to be protected from 1% annual chance flood event by a Federal flood protection system under construction; no base flood elevations determined.

ZONE V Coastal flood zone with velocity hazard (wave action); no base flood elevations determined.

ZONE VE Coastal flood zone with velocity hazard (wave action); base flood elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

ZONE X Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

ZONE X Areas determined to be outside the 0.2% annual chance floodplain.

ZONE D Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

- Floodplain Boundary
- Floodway Boundary
- Zone D Boundary
- Coastal Barrier Boundary
- Boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths or velocities.
- 513 — Base Flood Elevation line and value; elevation in feet*
- (EL 987) — Base Flood Elevation value where uniform within zone; elevation in feet*

*Referenced to the North American Vertical Datum of 1988

- (A)—(A) Cross Section Line
- (23)—(23) Transect Line
- 97°07'30", 32°22'30" Geographic coordinates referenced to the North American Datum of 1983 (NAD 83)
- 4276000m 1000-meter Universal Transverse Mercator grid values, zone 11
- 600000 FT 5000-foot grid ticks
- DX5510 Bench mark (see explanation in Notes to Users section of this FIRM panel)
- M1.5 River Mile

MAP REPOSITORY
Refer to Repository Listing on Index Map

EFFECTIVE DATE OF COUNTYWIDE FLOOD INSURANCE RATE MAP
AUGUST 16, 1995

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL
September 27, 2002: to update corporate limits, to change base flood elevations, to add base flood elevations, to add special flood hazard areas, to change special flood hazard areas, to delete special flood hazard areas, to change zone designations, to add roads and road names, to incorporate previously issued letters of map revision, to incorporate previously issued letters of map amendment, and to change floodway.

For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at (800) 638-6620.

MAP SCALE 1" = 2000'
1000 0 2000 4000 FEET
300 0 600 1200 METERS

PANEL 3325 E

FIRM
FLOOD INSURANCE RATE MAP
CLARK COUNTY
NEVADA AND
INCORPORATED AREAS

PANEL 3325 OF 4090

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
CLARK COUNTY, UNINCORPORATED AREAS	320003	3325	E

Notice to User: The Map Number shown below should be used when placing map orders; the Community Number shown above should be used on insurance applications for the subject community.

MAP NUMBER
32003C3325 E

MAP REVISED:
SEPTEMBER 27, 2002

Federal Emergency Management Agency

NOTES TO USERS

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. The **community map repository** should be consulted for possible updated or additional flood hazard information.

To obtain more detailed information in areas where **Base Flood Elevations** (BFEs) and/or **floodways** have been determined, users are encouraged to consult the Flood Profiles and Floodway Data tables contained within the Flood Insurance Study (FIS) report that accompanies this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded whole-foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

Coastal Base Flood Elevation (BFEs) shown on this map apply only landward of 0.0' North American Vertical Datum (NAVD). Users of this FIRM should be aware that coastal flood elevations may also be provided in the Summary of Stillwater Elevations table in the Flood Insurance Study report for this community. Elevations shown in the Summary of Stillwater Elevations table should be used for construction, and/or floodplain management purposes when they are higher than the elevations shown on this FIRM.

Boundaries of the **floodways** were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study report for this jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by **flood control structures.** Refer to Section 2.4 "Flood Protection Measures" of the Flood Insurance Study report for information on flood control structures in this jurisdiction.

The **projection** used in the preparation of this map is Universal Tranverse Mercator (UTM) Zone 11. The **horizontal** datum is NAD83, GRS1980 spheroid. Differences in datum, spheroid, projection or UTM zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of the FIRM.

Flood elevations on this map are referenced to the North American Vertical Datum of 1988. These flood elevations must be compared to structure and ground elevations referenced to the same **vertical datum.** For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at www.ngs.noaa.gov or contact the National Geodetic Survey at the following address:

Vertical Network Branch, N/CG13
National Geodetic Survey, NOAA
Silver Spring Metro Center 3
1315 East-West Highway
Silver Spring, Maryland 20910
(301) 713-3191

To obtain current elevation, description, and/or location information for **bench marks** shown on this map, please contact the Information Services Branch of the National Geodetic Survey at **(301) 713-3242**, or visit their website at www.ngs.noaa.gov.

Base map information shown on this FIRM was provided in digital format by Clark County Regional Flood Control District. This information was converted using Orthophotography, dated 1995 or newer, and GBF/DIME data. Segments were digitized off of the orthophotography based on center of pavement.

Corporate limits shown on this map are based on the best data available at the time of publication. Because changes due to annexations or de-annexations may have occurred after this map was published, map users should contact appropriate community officials to verify current corporate limit locations.

Please refer to the separately printed **Map Index** for an overview map of the county showing the layout of map panels; community map repository addresses; and a Listing of Communities table containing National Flood Insurance Program dates for each community as well as a listing of the panels on which each community is located.

An accompanying Flood Insurance Study report, Letters of Map Revision or Letters of Map Amendment revising portions of this panel, and digital versions of this PANEL may be available. Contact the **FEMA Map Service Center** at the following phone numbers and Internet address for information on all related products available from FEMA:

Phone: 800-358-9616
FAX: 800-358-9620
www.fema.gov/mac

If you have **questions about this map** or questions concerning the National Flood Insurance Program in general, please call **1-877-FEMA-MAP** (1-877-336-2627) or visit the FEMA website at www.fema.gov.

This map reflects more detailed and up-to-date stream channel configurations than those shown on the previous FIRM for this jurisdiction. The floodplains and floodways that were transferred from the previous FIRM may have been adjusted to conform to these new stream channel configurations. As a result, the Flood Profiles and Floodway Data tables in the Flood Insurance Study report may reflect stream channel distances that differ from what is shown on this map.

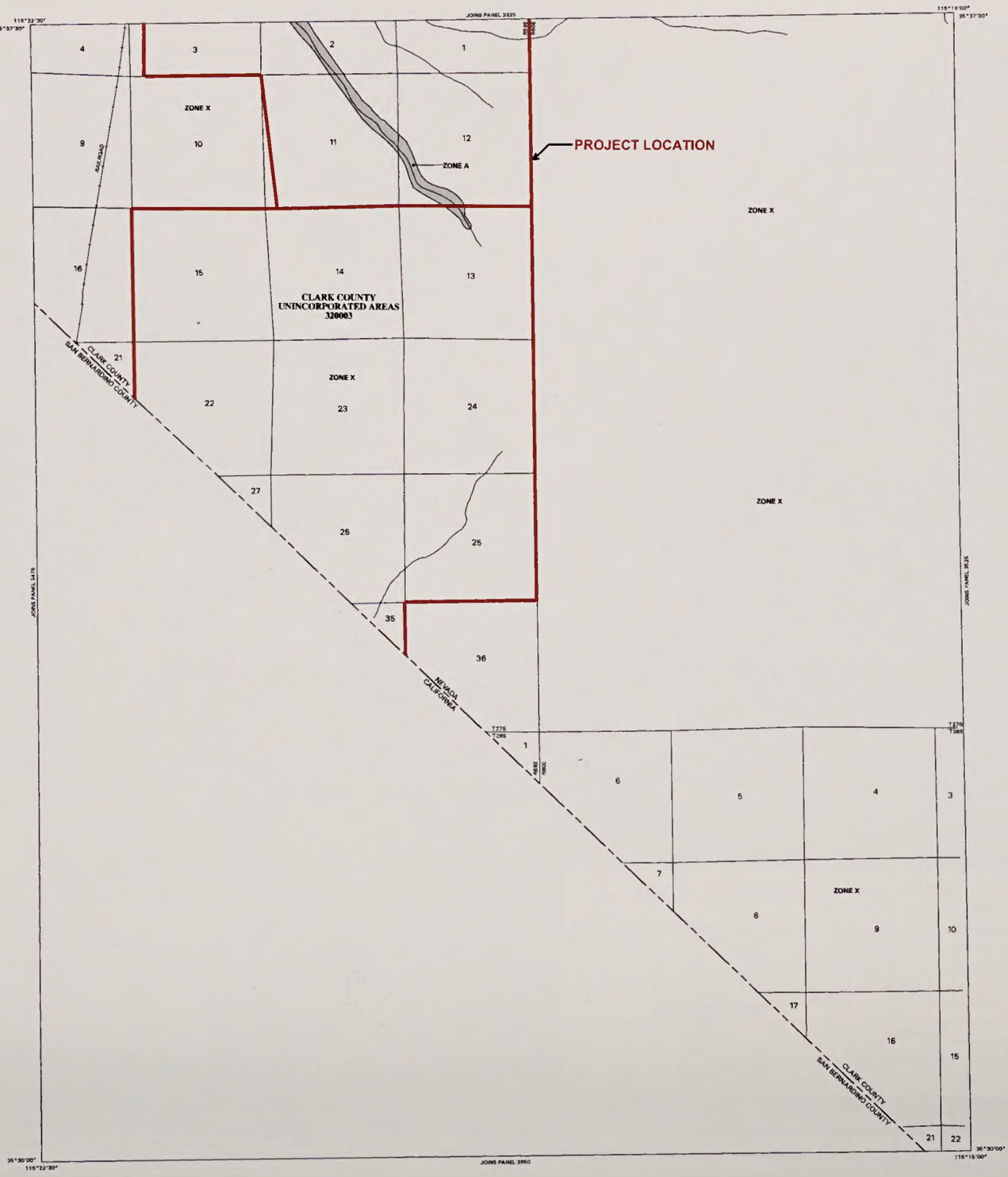
This Digital Flood Insurance Rate Map (DFIRM) was produced through a unique partnership between Clark County and the Federal Emergency Management Agency (FEMA). Clark County has developed a long-term approach of floodplain management to decrease the costs associated with flooding. This is demonstrated by the Clark County commitment to share and maintain floodplain layers within their Geographic Information System Management Office (GISMO).

This DFIRM reflects several innovative features. These include:

+ Southern Nevada GIS – Cooperation among local governmental agencies throughout Clark County. The foundation of cooperation is the GIS Interlocal Agreements formed between fourteen regional participants. In part, the agreements specify that the Clark County GIS Management Office (GISMO) will be responsible for maintaining a GIS data warehouse and associated Southern Nevada GIS Metadata.

+ The GISMO's responsibilities go beyond maintaining the GIS data warehouse. GISMO also maintains the Street Centerline Database used by 911 dispatch services. This centerline database serves as the base map for this DFIRM.

DIGITAL DATA AVAILABILITY: http://www.co.clark.nv.us/osit/gismo/gismo.htm



LEGEND

SPECIAL FLOOD HAZARD AREAS SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD EVENT

The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V, and VE. The Base Flood Elevation is the water surface elevation of the 1% annual chance flood.

ZONE A No base flood elevations determined.

ZONE AE base flood elevations determined.

ZONE AH Flood depths of 1 to 3 feet (usually areas of ponding); base flood elevations determined.

ZONE AO Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.

ZONE AR Area of special flood hazard formerly protected from the 1% annual chance flood event by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood event.

ZONE A99 Area to be protected from 1% annual chance flood event by a Federal flood protection system under construction; no Base Flood elevations determined.

ZONE V Coastal flood zone with velocity hazard (wave action); no base flood elevations determined.

ZONE VE Coastal flood zone with velocity hazard (wave action); base flood elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

ZONE X Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

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OTHERWISE PROTECTED AREAS (OPAs)

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- Floodway Boundary
- Zone D Boundary
- Coastal Barrier Boundary
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- 513 — Base Flood Elevation line and value; elevation in feet*
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*Referenced to the North American Vertical Datum of 1988

- (A)—(A) Cross Section Line
- (23)—(23) Transect Line
- 97°07'30", 32°22'30" — Geographic coordinates referenced to the North American Datum of 1983 (NAD 83)
- 4276000M — 1000-meter Universal Transverse Mercator grid values, zone 11
- 500000 FT — 5000-foot grid ticks
- DX5510 — Bench mark (see explanation in Notes to Users section of this FIRM panel)
- M1.5 — River Mile

MAP REPOSITORY
Refer to Repository Listing on Index Map

EFFECTIVE DATE OF COUNTYWIDE FLOOD INSURANCE RATE MAP
AUGUST 16, 1995

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL
September 27, 2002: to update corporate limits, to change base flood elevations, to add base flood elevations, to add special flood hazard areas, to change special flood hazard areas, to delete special flood hazard areas, to change zone designations, to add roads and road names, to incorporate previously issued letters of map revision, to incorporate previously issued letters of map amendment, and to change floodway.

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MAP SCALE 1" = 2000'

1000 0 2000 4000 FEET
600 0 600 1200 METERS

PANEL 3500 E

FIRM
FLOOD INSURANCE RATE MAP
CLARK COUNTY, NEVADA AND INCORPORATED AREAS

PANEL 3500 OF 4090

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
CLARK COUNTY, UNINCORPORATED AREAS	320003	3500	E

Notice to User: The Map Number shown below should be used when placing map orders; the Community Number shown above should be used on insurance applications for the subject community.

MAP NUMBER
32003C3500 E

MAP REVISED:
SEPTEMBER 27, 2002

Federal Emergency Management Agency

FIGURE 2.2 B

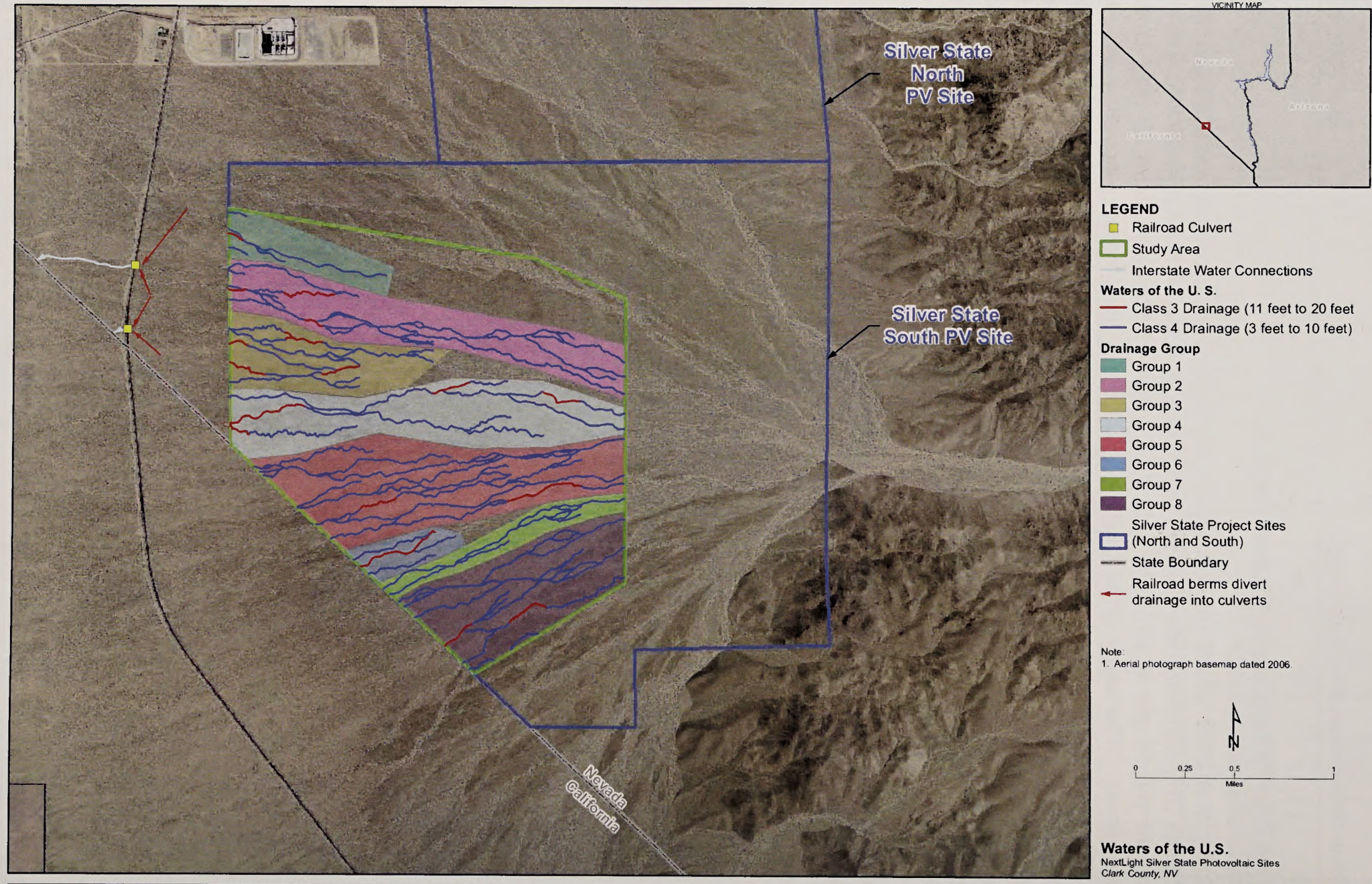
2.3 Silver State Project Reports

In October 2009, CH2M Hill conducted investigations to delineate Waters of the United States (WOUS) for the Silver State Project (CH2M, 2009). This study identified washes on the project site in which the U.S. Army Corps of Engineers (USACE) may assert jurisdiction. The study notes that the USACE will likely assert jurisdiction over all washes greater than or equal to 3 feet in width that intersect the Nevada-California state line. The USACE will not assert jurisdiction over washes not defined as interstate or that flow in a northerly direction towards Roach Dry Lake. Approximately 37 acres of ephemeral washes subject to USACE jurisdiction were identified and mapped in the project area (see Figure 2.3). Development of the Silver State Photovoltaic Power Project will not affect the flow rate, depth or velocity of flow in the delineated WOUS.

Other relevant studies that have been prepared in association with the Silver State Project include:

- Conceptual Drainage Study Primm Solar Generating Plant, Clark County, Nevada. Prepared for NextLight Renewable Power, LLC by WorleyParsons Group, Inc., dated September 25, 2008.

- Silver State North Photovoltaic Power Project, Draft Plan of Development, Amendment. Prepared for NextLight Renewable Power, LLC by CH2MHILL, May, 2009.



Waters of the U.S.
NextLight Silver State Photovoltaic Sites
Clark County, NV

\\ELVIS\GIS\PROJECTS\NEXTLIGHT\393303_SILVERSTATETO8\MAPFILES\NL_SS_WD_FIG3_1_US_WATERS.MXD KBROCK 9/14/2009 15:08:13

CH2MHILL

FIGURE 2.3

3.0 HYDROLOGIC AND HYDRAULIC ANALYSIS

This section presents the methods used to develop the hydrologic and hydraulic models presented in this study. The focus of the section is the model selection, mapping and other data sources, and development of the model input parameters. Discussion of the results of the analyses is reserved for Section 4.

3.1 Modeling Method

Hydrologic models were prepared to evaluate pre-development and post-development conditions in accordance with the guidelines presented in the CCRFCD Hydrologic Criteria and Drainage Design Manual (CCRFCD, 1999), herein referred to as the Design Manual. Rainfall-runoff modeling was performed using HEC-1 Flood Hydrograph Package Version 4.1 (USACE, 1998). HEC-1 is a public domain program developed by the U.S. Army Corps of Engineers and is the most commonly used program for rainfall-runoff modeling in Clark County.

For this study, the Soil Conservation Service (SCS) Unit Hydrograph Method Option in HEC-1 was used to evaluate rainfall-runoff for mountain areas. Direct and indirect input used for HEC-1 model generation includes basin area, soils characterization, land use, curve numbers, topographic data, point precipitation, rainfall duration and time distribution, time of concentration, and hydrograph lag time.

HEC-1 models were developed for the mountain areas in order to determine the flood hydrographs at the apexes of the alluvial fans. The HEC-1 model results are discussed in Section 4.1 and the model output is provided in Appendix A.4 of this report. The models are also included on the enclosed Data CD.

The apex flood hydrographs were then input into the FLO-2D model to evaluate flow across the surface of the fans. FLO-2D is a proprietary software package that is particularly appropriate for evaluating flow patterns, depth and velocity on alluvial fans. FLO-2D has been accepted for use by Clark County Development Services, Clark County Regional Flood Control District (CCRFCD), and FEMA. Input for the FLO-2D model included topographic digital terrain model (DTM), node size, area reduction factor, and hydraulic roughness. Pre-development and post-development conditions were modeled using FLO-2D. The FLO-2D models are included on the enclosed Data CD.

In this study, it was assumed that the worst-case event on the alluvial fan surface would be a flood emanating from the apex. Rainfall on the fan surface was not modeled and was assumed to be offset by infiltration losses on the fan surface. This assumption is commonly applied for alluvial fan flood assessment; see for example, FEMA' alluvial fan flood hazard model (FEMA, 1990). Flows developed by rain on the fan surface may be significant and should be evaluated during the detailed design of the project.

Methods and procedures for developing input parameters for the HEC-1 and FLO-2D models are presented in the following sections. Supporting information and calculations are contained in Appendix A.

3.2 Drainage Basins

The drainage areas contributing to the fan apexes were delineated using Clark County's GIS contour mapping covering the mountain areas. Figure 4.1 shows the boundaries of mountain drainage areas which were subdivided into the Basins 1 through 9.

3.3 Precipitation

3.3.1 Design Storm

In accordance with the Design Manual, the 100-year frequency, 6-hour duration design storm event was used to evaluate pre- and post-development drainage conditions at the site. Unless specified otherwise, all flow rates, depths and velocities discussed in this study are with reference to the 100-year, 6-hour event.

The point rainfall depth used in the model was determined by first plotting the location of the mountain areas on the Figure 506 of the Design Manual (see Appendix A.1) to obtain the National Oceanic and Atmospheric Administration (NOAA) 100-year, 6-hour rainfall depth.

The average 100-year, 6-hour NOAA rainfall depth was determined to be 2.40 inches for the northern mountain area Basins 2 though 9, and 2.80 for the southern mountain area Basin 1. The NOAA values were then multiplied by 1.43 as recommended in the Design Manual (Table 501) to obtain the rainfall depth for the area (see Table 3.1)

Widespread storms generally produce less rainfall than smaller storm cells. Therefore, the rainfall depth was adjusted using a depth-area-adjustment factor (DARF) to account for the relationship between the rainfall depth and the size of the basin. The DARF values were obtained from Table 205 of the Design Manual and input into the HEC-1 model on the JR card.

Table 3.1 Rainfall Depth

Drainage Area	Rainfall Depth (inches)
Southern Mountain Basin 1	4.00
Northern Mountain Basins 2 through 9	3.43

3.3.2 Storm Distribution Number (SDN)

Three different storm distributions are used as design storms in Clark County to account for the relationship between rainfall intensity and storm size. The design storms are designated as SDN3, SDN4 and SDN5. SDN3 is applied to storms covering an area less than eight square miles, SDN4 to areas between eight and 12 square miles, and SDN5 to areas greater than 12 square miles. SDN3 is the most intense and SDN5 the least intense of the three rainfall distributions. The SDN's are presented graphically on Figure 515 of the Design Manual and tabularized in Table 503 of the Design Manual.

Two different storms were modeled in this study to evaluate flows from the northern mountain basins and the southern mountain basin (see Figure 3.1):

- A 5.6 square mile SDN3 storm centered over the northern mountains basins (Basins 2 through 9).
- A 17.2 square mile SDN5 storm centered over the southern mountain basin (Basin 1).

It should be noted that an SDN3 and SDN4 storm were modeled over the lower portion of the southern mountain basin but found to produce lower flow rates than the SDN5.

3.4 Time of Concentration and Lag Time

Times of concentration were calculated for use with the SCS Unit Hydrograph Method in HEC-1. For drainage basins less than one square mile in area (Basins 2 through 9), equations presented in Section 602 of the Design Manual were used. Lag time was then calculated from Equation 612 of the Design Manual.

The time of concentration and lag time calculations are tabulated in Table A.2.1 (Standard Form 4 of the Design Manual) which is included in Appendix A.2 of this report. An explanation of the equations used is also provided as Table A.2.2 in Appendix A.2.

For areas greater than one square mile (Basin 1), lag time was calculated using Equation 613 of the Design Manual. The calculations are tabulated on Table A.2.3 in Appendix A.2.

3.5 Soil Group and Curve Numbers

Precipitation losses due to land surface interception, depression storage and infiltration were simulated using the SCS curve number (CN) method (Section 603.2 of the Design Manual) for the HEC-1 model. Curve numbers were developed in accordance with Section 603.2.1 of the Design Manual.

The CN is based upon soil type, cover type, and antecedent moisture content (AMCII assumed). Soils type was obtained from the GIS soils coverage provided on the backup CD for the Las Vegas Valley Flood Control Facilities Master Plan Update (CCRFCD, 2008). The soils map presented on Figure 3.1 shows soils types in the mountain areas were classified as Hydrologic Soil Groups C and D with minor areas of Hydrology Soil Group A.

The cover type for this project is described as semiarid rangelands - desert shrub/poor conditions. Table 3.2 presents the curve numbers for the various hydrologic soil groups for AMC II conditions (Design Manual - Table 602).

Table 3.2 Cover Type - CN values for Soil Groups

Cover Type	Soil Group A	Soil Group B	Soil Group C	Soil Group D
Semiarid Rangelands - Desert Shrub/Poor	63	77	85	88

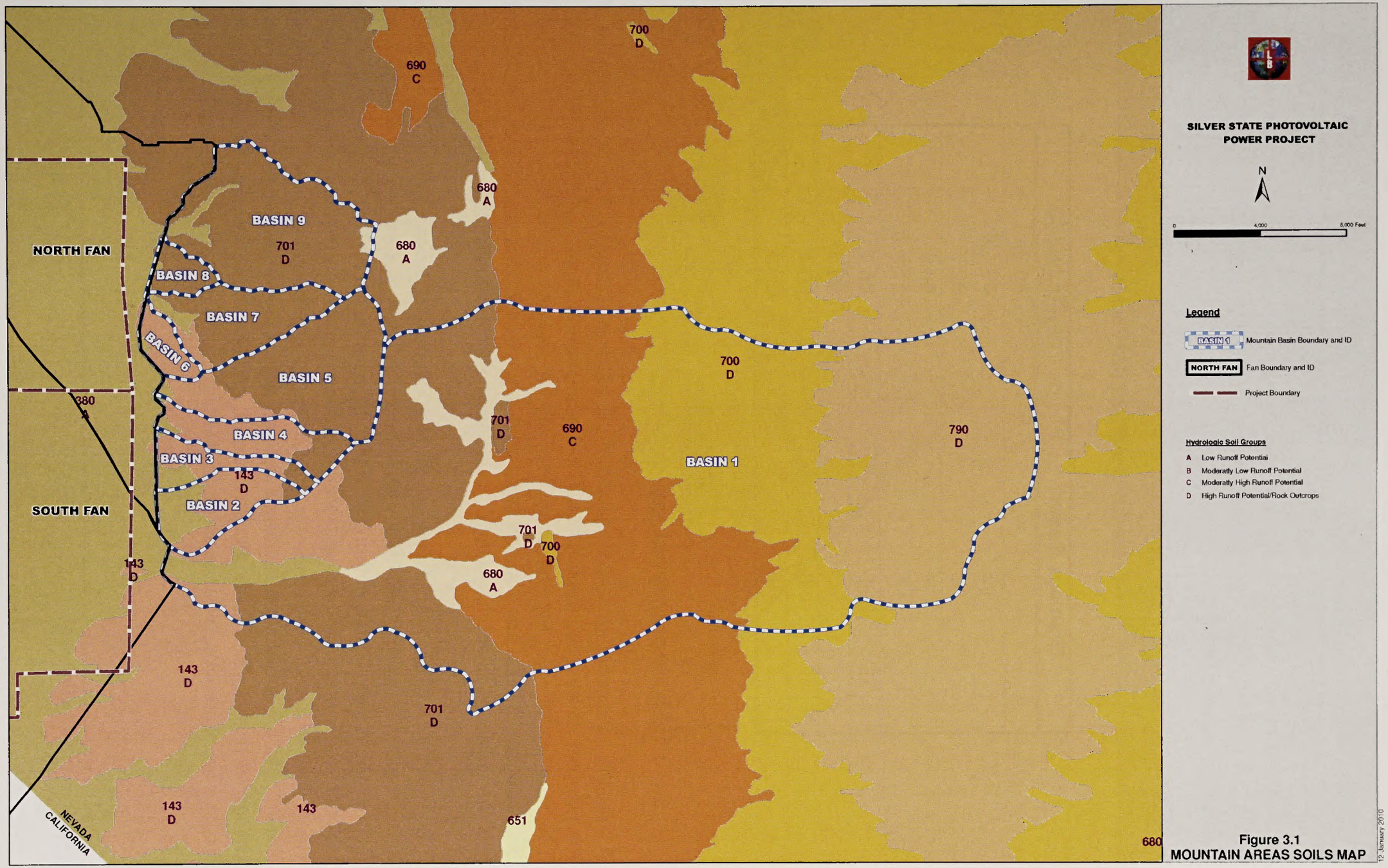


Figure 3.1
MOUNTAIN AREAS SOILS MAP

A weighted curve number was calculated for each drainage basin as summarized in Table 3.3 and input into the HEC-1 (LS line). Detailed calculations for the weighted curve numbers are provided in Appendix A.3.

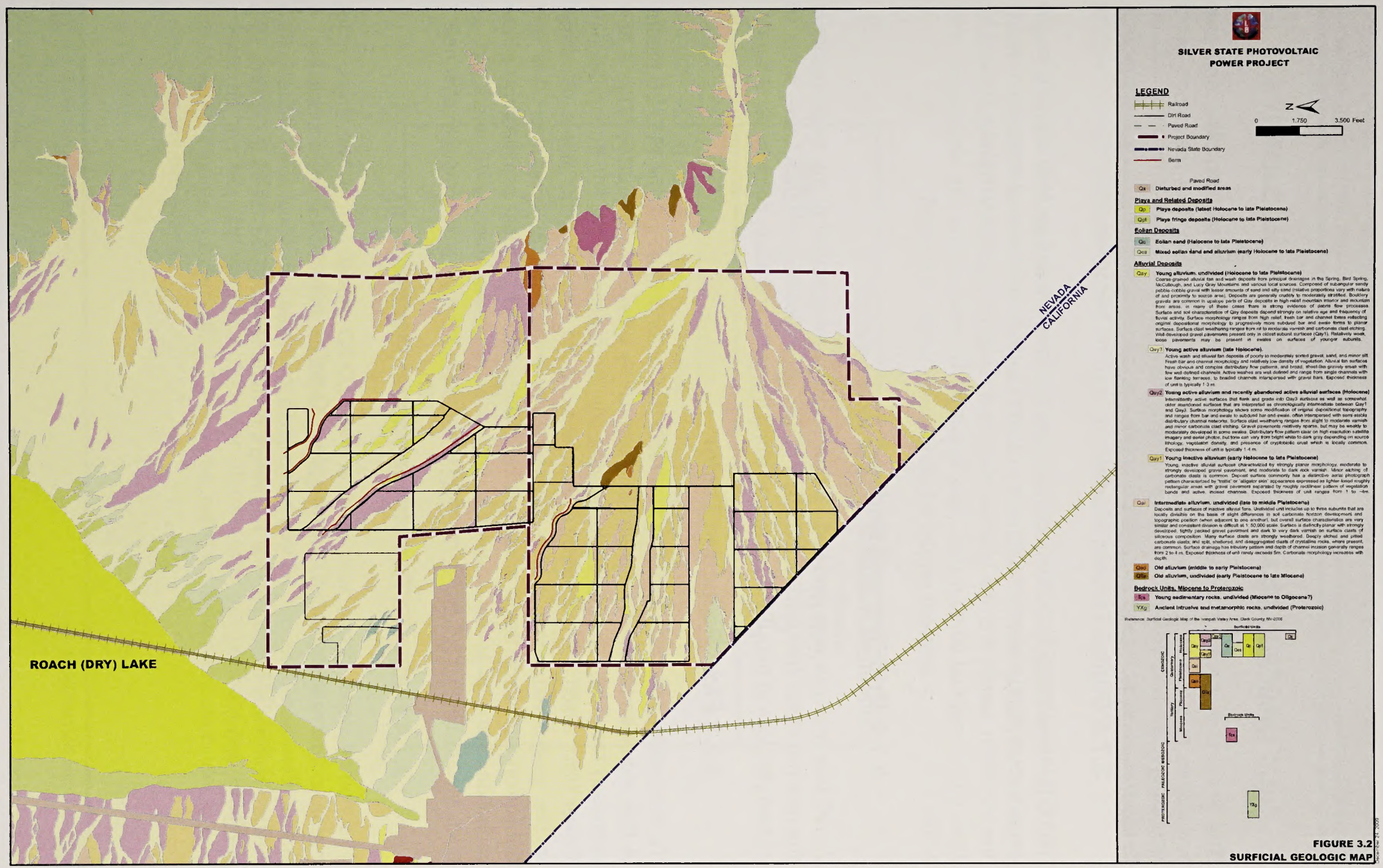
Table 3.3 Weighted CN Values

Drainage Basin	Weighted CN
1	85.3
2	80.1
3	82.7
4	86.8
5	87.7
6	86.4
7	86.5
8	86.4
9	86.8

3.6 FAN Geomorphology

A valuable source of information utilized in this study was the Surficial Geologic Map of the Ivanpah Valley Area, Clark County, Nevada (Ramelli, et.al., 2006) (see Figure 3.2). The Surficial Geologic Map describes the alluvial deposits on the surfaces of the fans and categorizes them according to age. This is important because surfaces of different age are indicators of flooding activity, or lack thereof, on different portions of the fan.

The Surficial Geologic Map delineates surface deposits of different ages based on fan surface morphology and sediment weathering characteristics as described in the map legend. As a general rule of thumb, alluvial deposits less than 1,000 years of age (late Holocene) are considered active flooding surfaces, on an engineering timescale, while those greater than 1,000 years are considered to be abandoned and inactive (NRC, 1996). At the project site, surfaces defined as Qay3 - Young Active Alluvium (late Holocene) and Qay2 – Young Active Alluvium and Recently Abandoned Active Alluvial Surfaces (Holocene) were considered to be active surfaces subject to flooding during a 100-year event.



SILVER STATE PHOTOVOLTAIC POWER PROJECT

LEGEND

- Railroad
- Dirt Road
- Paved Road
- Project Boundary
- Nevada State Boundary
- Berm

N

0 1,750 3,500 Feet

Paved Road

Qx Disturbed and modified areas

Playa and Related Deposits

Qp Playa deposits (latest Holocene to late Pleistocene)

Qpf Playa fringe deposits (Holocene to late Pleistocene)

Eolian Deposits

Qe Eolian sand (Holocene to late Pleistocene)

Qea Mixed eolian sand and alluvium (early Holocene to late Pleistocene)

Alluvial Deposits

Qay Young alluvium, undivided (Holocene to late Pleistocene)
Coarse-grained alluvial fan and wash deposits from principal drainages in the Spring, Bird Spring, McCullough, and Lucy Gray Mountains and various local sources. Composed of subangular sandy pebble-cobble gravel with lesser amounts of sand and silty sand (relative proportions vary with nature of and proximity to source area). Deposits are generally crudely to moderately stratified. Boulderry gravels are common in upslope parts of Qay deposits in high relief mountain interior and mountain front areas, in many of these cases there is strong evidence of debris flow processes. Surface and soil characteristics of Qay deposits depend strongly on relative age and frequency of fluvial activity. Surface morphology ranges from high relief, fresh bar and channel forms reflecting original depositional morphology to progressively more subdued bar and swale forms to planar surfaces. Surface clast weathering ranges from nil to moderate varnish and carbonate clast etching. Well-developed gravel pavements present only in oldest subunit surfaces (Qay1). Relatively weak, loose pavements may be present in swales on surfaces of younger subunits.

Qay3 Young active alluvium (late Holocene).
Active wash and alluvial fan deposits of poorly to moderately sorted gravel, sand, and minor silt. Fresh bar and channel morphology and relatively low density of vegetation. Alluvial fan surfaces have obvious and complex distributary flow patterns, and broad, sheet-like gravelly areas with few well defined channels. Active washes are well defined and range from single channels with low flanking terraces, to braided channels interspersed with gravel bars. Exposed thickness of unit is typically 1-3 m.

Qay2 Young active alluvium and recently abandoned active alluvial surfaces (Holocene)
Intermittently active surfaces that flank and grade into Qay3 surfaces as well as somewhat older abandoned surfaces that are interpreted as chronologically intermediate between Qay1 and Qay3. Surface morphology shows some modification of original depositional topography and ranges from bar and swale to subdued bar and swale, often interspersed with semi-stable distributary channel networks. Surface clast weathering ranges from slight to moderate varnish and minor carbonate clast etching. Gravel pavements relatively sparse, but may be weakly to moderately developed in some swales. Distributary flow pattern clear on high-resolution satellite imagery and aerial photos, but tone can vary from bright white to dark gray depending on source lithology, vegetation density, and presence of cryptobiotic crust which is locally common. Exposed thickness of unit is typically 1-4 m.

Qay1 Young inactive alluvium (early Holocene to late Pleistocene)
Young, inactive alluvial surfaces characterized by strongly planar morphology, moderate to strongly developed gravel pavement, and moderate to dark rock varnish. Minor etching of carbonate clasts is common. Deposit surfaces commonly has a distinctive aerial photograph pattern characterized by "trellis" or "alligator skin" appearance expressed as lighter-toned roughly rectangular areas with gravel pavement separated by roughly rectilinear pattern of vegetation bands and active, incised channels. Exposed thickness of unit ranges from 1 to ~4m.

Qai Intermediate alluvium, undivided (late to middle Pleistocene)
Deposits and surfaces of inactive alluvial fans. Undivided unit includes up to three subunits that are locally divisible on the basis of slight differences in soil carbonate horizon development and topographic position (when adjacent to one another), but overall surface characteristics are very similar and consistent division is difficult at 1: 50,000 scale. Surface is distinctly planar with strongly developed, tightly packed gravel pavement and dark to very dark varnish on surface clasts of siliceous composition. Many surface clasts are strongly weathered. Deeply etched and pitted carbonate clasts, and split, shattered, and disaggregated clasts of crystalline rocks, where present, are common. Surface drainage has tributary patterns and depth of channel incision generally ranges from 2 to 4 m. Exposed thickness of unit rarely exceeds 5m. Carbonate morphology increases with depth.

Qao Old alluvium (middle to early Pleistocene)

QTai Old alluvium, undivided (early Pleistocene to late Miocene)

Bedrock Units, Miocene to Proterozoic

Tos Young sedimentary rocks, undivided (Miocene to Oligocene?)

YXg Ancient intrusive and metamorphic rocks, undivided (Proterozoic)

Reference: Surficial Geologic Map of the Ivanpah Valley Area, Clark County, NV-2008

FIGURE 3.2
SURFICIAL GEOLOGIC MAP

December 21, 2009

3.7 Other FLO-2D Input

The FLO-2D model input requires a digital terrain model (DTM), grid size, and area reductions to account for obstructions to flow, and hydraulic flow resistance factor (Manning's n).

3.7.1 Digital Terrain Model

The DTM used in the FLO-2D model was created from one-foot contour mapping for the project covering the alluvial fan area and Clark County's GIS contour mapping covering the mountain areas. For the post-development model, a second DTM was created for from the conceptual contour plan (see Appendix B) representing site topography after tilling.

3.7.2 Grid Size and Nodes

A 125 foot grid size was modeled. Inflow nodes were specified at the outlet points of the nine mountain area basins. Outflow nodes were specified at Roach Lake, at the 18 culverts/bridges at the UPRR track, and along the north and south boundaries of fans.

3.7.3 Flow Reduction Factor

To account for flow obstructions, a flow reduction factor is input into the FLO-2D model. A flow reduction factor of 1 equates to a completely blocked or obstructed grid. A flow reduction factor of 1 was used to prevent flow from entering the NV Energy Higgins Power Plant which is protected by a channel along the east and south sides. Similarly, in the post-development model, flow was prevented from entering the O&M and substation site since these areas will be elevated on fill. Most significantly, a flow reduction factor of 1 was applied to fan surfaces greater than 1,000 years old, as discussed in Section 3.6, which restricted flooding to the more active modern channels.

3.7.4 Hydraulic Resistance Factor (Manning's n)

The normal depth option was used in the FLO-2D model with a Manning's n for hydraulic flow resistance of 0.05 for natural conditions and 0.03 for tilled conditions. A limiting Froude number of 0.95 was established to ensure subcritical flow. If the limiting Froude number is exceeded, the Manning's n-value is increased for the next time step (FLO-2D, 2009).

4.0 HYDROLOGIC AND HYDRAULIC MODEL RESULTS

4.1 Mountain Area HEC-1 Model Results

As discussed in Section 3.3, different storms were modeled in this study over the northern and southern mountain basins. Using HEC-1, the apex flow rates associated with each event were developed and are presented in Table 4.1.

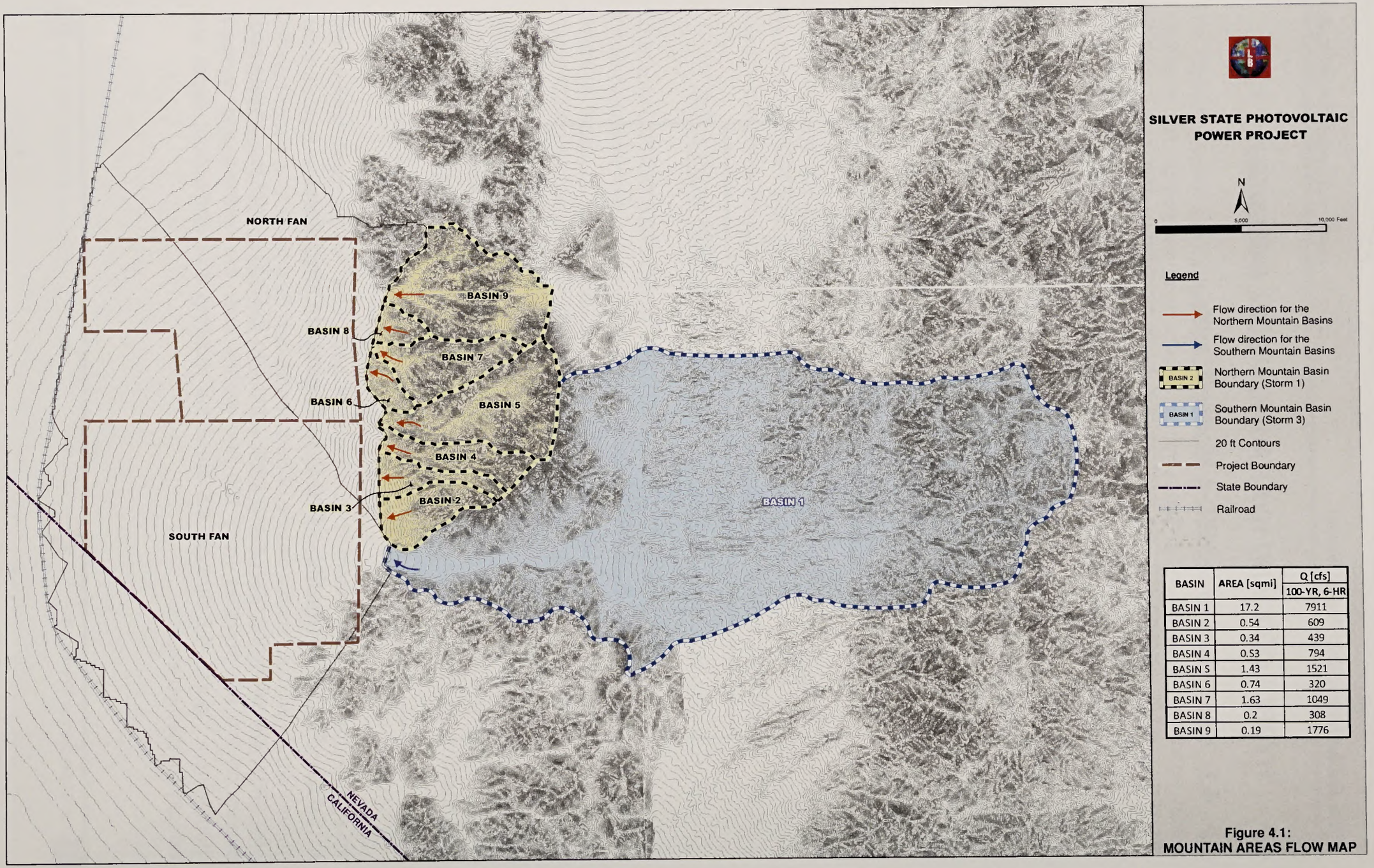
Figure 4.1 is a flow map that shows the results of the HEC-1 models for the southern (SDN5) and northern mountain basins (SDN3). The HEC-1 model output for the storm events is provided in Appendix A.4.

Table 4.1 Apex Flow Rates for Storm Centers

Basin	Northern Mountain Basins (SDN3)	Southern Mountain Basin (SDN5)
	Q (cfs)	Q (cfs)
1	-	7911
2	609	-
3	439	-
4	794	-
5	1521	-
6	320	-
7	1049	-
8	308	-
9	1776	-

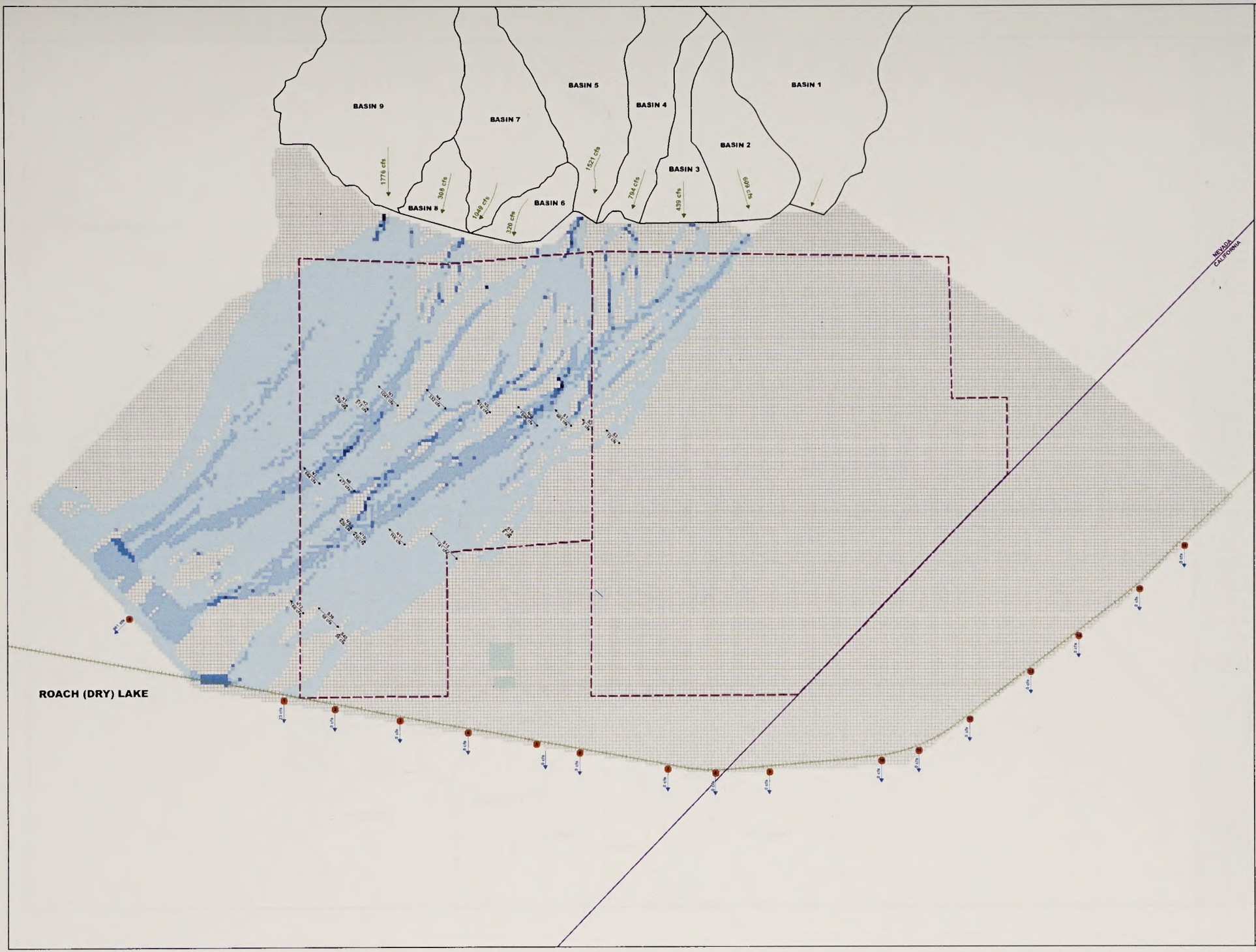
4.2 FLO-2D Results – Pre-Development Conditions

The apex flow rates for each storm were input into FLO-2D model to simulate flood events on the fan surfaces from 100-year storms over the northern and southern mountains. Figures 4.2 through 4.5 show the resulting flow distribution, depth and velocity for the two events.



BASIN	AREA [sqmi]	Q [cfs] 100-YR, 6-HR
BASIN 1	17.2	7911
BASIN 2	0.54	609
BASIN 3	0.34	439
BASIN 4	0.53	794
BASIN 5	1.43	1521
BASIN 6	0.74	320
BASIN 7	1.63	1049
BASIN 8	0.2	308
BASIN 9	0.19	1776

Figure 4.1:
MOUNTAIN AREAS FLOW MAP



SILVER STATE PHOTOVOLTAIC POWER PROJECT

N

0 1,500 3,000 Feet

LEGEND

- NV Energy Higgins Power Plant Substation
- Project Boundary
- Railroad
- Outflow Node and ID
- Culvert Flow
- Inflow from Mountain Areas
- BASIN 1 — Mountain Basin Boundary and ID
- N1 195 cfs — Section Limit, ID#, Flow (cfs)
- State Boundary

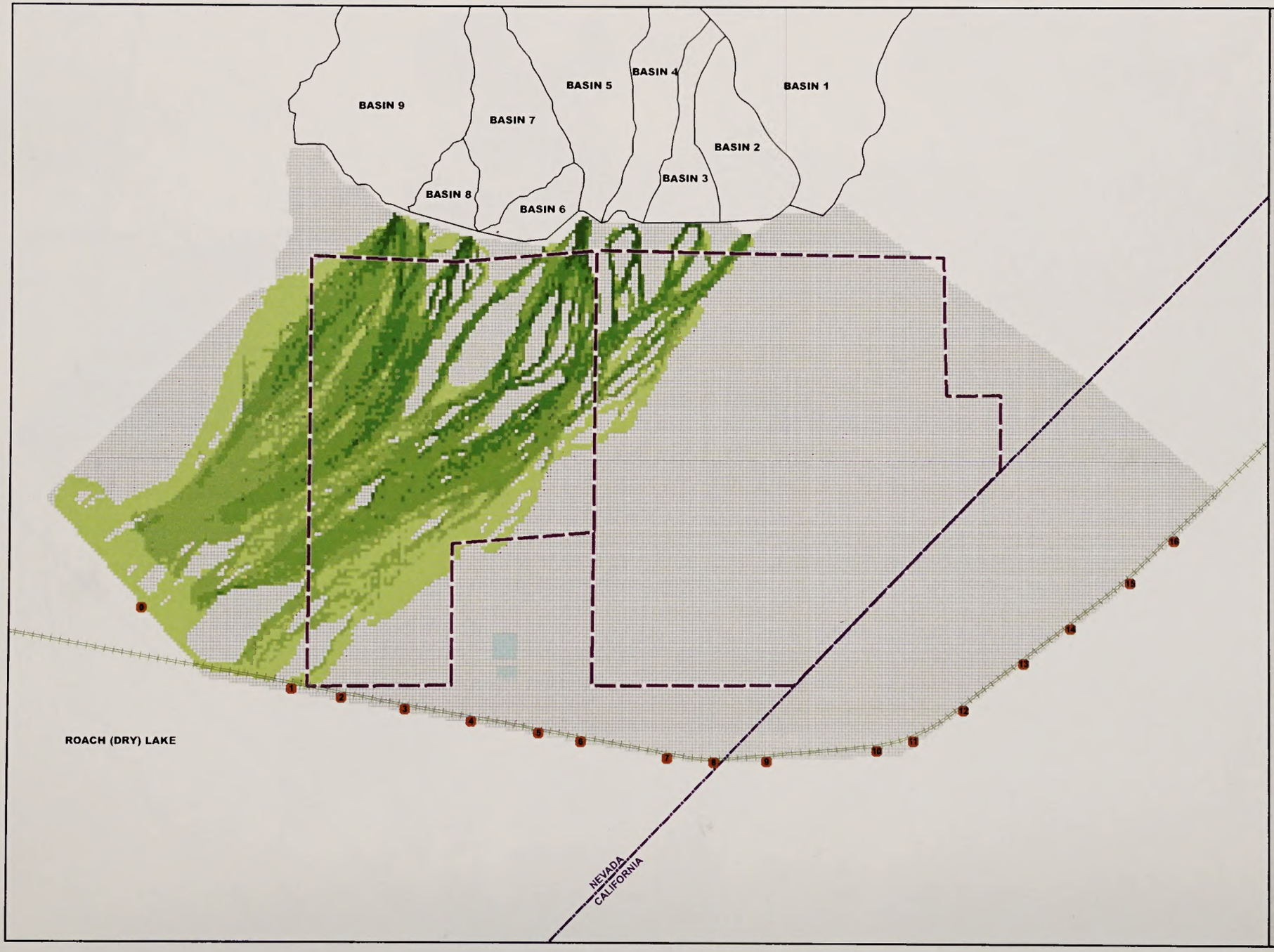
Depth Range (feet)

- 0.010 - 0.500
- 0.501 - 1.000
- 1.001 - 1.500
- 1.501 - 2.000
- 2.001 - 2.500

Outflow Nodes Information	
Node	Description
1	6'x4' RCB
2	2-6'x4' RCB
3	2-6'x4' RCB
4	2-6'x4' RCB
5	2-48" CMP
6	7'X5' RCB
7	2-7'X5' RCB
8	2-7'X5' RCB
9	7'X5' RCB
10	5-12.6'X7.2' Bridge
11	8'x6' RCB
12	2-7'X5' RCB
13	18.7'X6.3' Bridge
14	18.7'X6.3' Bridge
15	2-6'x4' RCB
16	2-6'x6' RCB

FIGURE 4.2
NORTHERN FAN
PRE-DEVELOPMENT FLOW MAP

January 13, 2010



SILVER STATE PHOTOVOLTAIC POWER PROJECT

N

0 1,700 3,400 Feet

LEGEND

- NV Energy Higgins Power Plant Substation
- Project Boundary
- 1 Outflow Node and ID
- BASIN 1 Mountain Basin Boundary and ID
- Railroad
- State Boundary

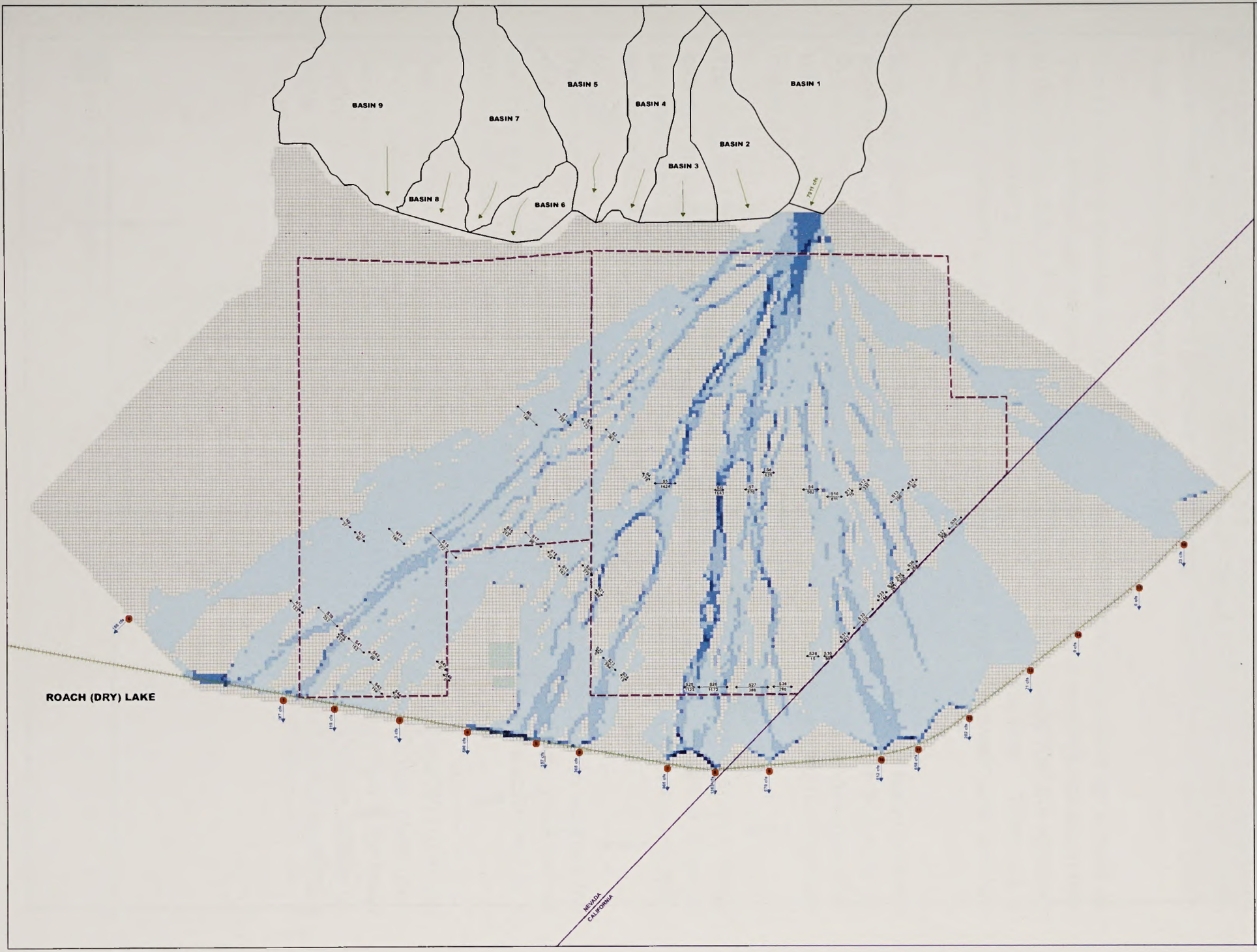
Velocity range (ft/s)

- 0.00 - 1.00
- 1.01 - 2.00
- 2.01 - 3.00
- 3.01 - 4.00
- > 4.00

Outflow Nodes Information	
Node	Description
1	6'x4' RCB
2	2-6'x4' RCB
3	2-6'x4' RCB
4	2-6'x4' RCB
5	2-48" CMP
6	7'X5' RCB
7	2-7'X5' RCB
8	2-7'X5' RCB
9	7'X5' RCB
10	5-12.8'X7.2' Bridge
11	8'x6' RCB
12	2-7'X5' RCB
13	16.7'X6.3' Bridge
14	16.7'X6.3' Bridge
15	2-6'x4' RCB
16	2-8'x5' RCB

FIGURE 4.3
NORTHERN FAN
PRE-DEVELOPMENT VELOCITY MAP

12 January 2010



SILVER STATE PHOTOVOLTAIC POWER PROJECT

N

0 1,500 3,000 Feet

LEGEND

- NV Energy Higgins Power Plant Substation
- Project Boundary
- Outflow Node and ID
- Flow
- Railroad
- Inflow from Mountain Areas
- BASIN 1 — Mountain Basin Boundary and ID
- 51 / 100 — Section ID # / Section Flow (cfs)
- State Boundary

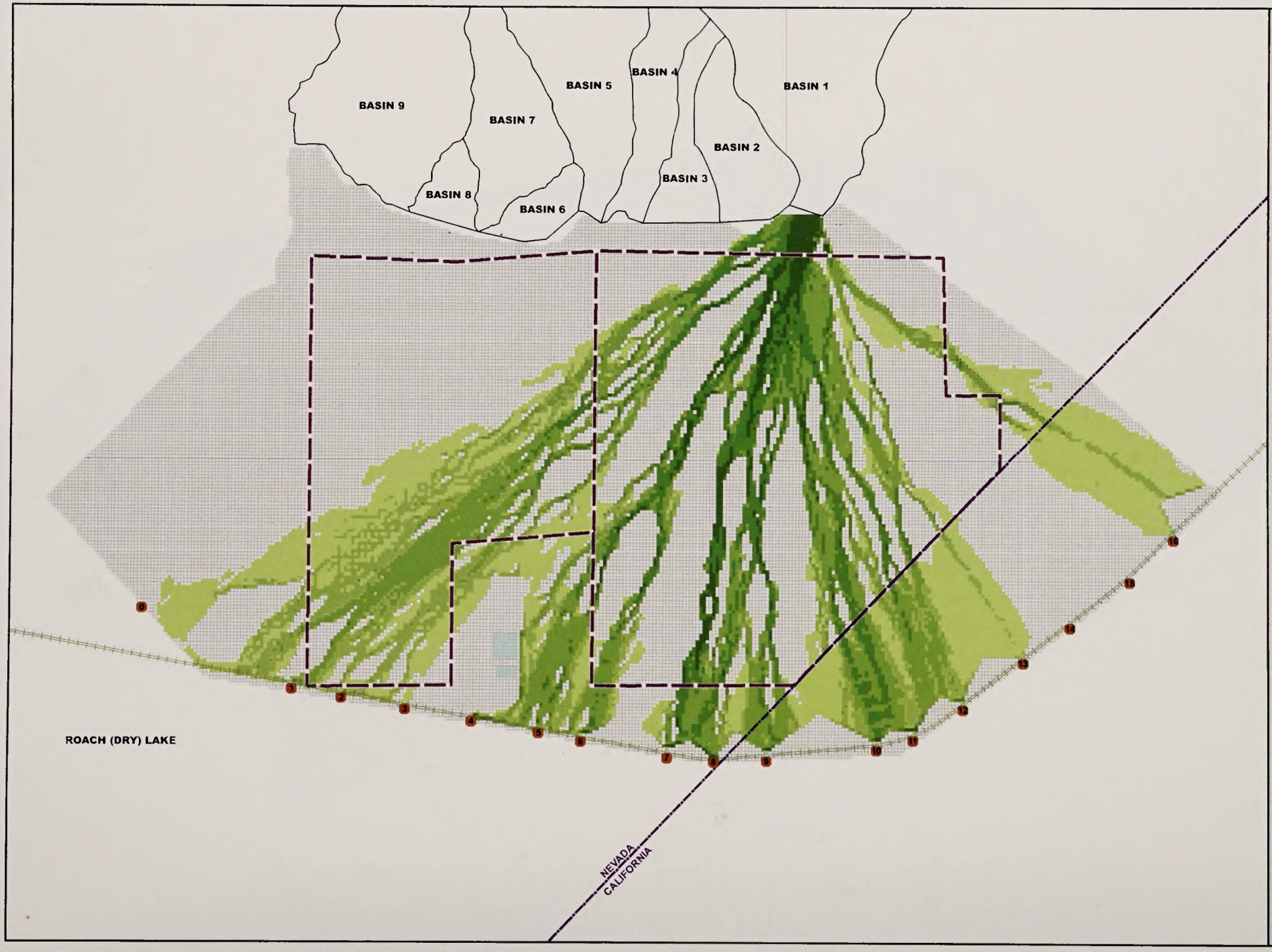
Depth Range (feet)

- 0.010 - 0.500
- 0.501 - 1.000
- 1.001 - 1.500
- 1.501 - 2.000
- 2.001 - 2.500
- > 2.50

Outflow Nodes Information	
Node	Description
1	6-x4' RCB
2	2-6'x4' RCB
3	2-6'x4' RCB
4	2-8'x4' RCB
5	2-48" CMP
6	7'X5' RCB
7	2-7'X5' RCB
8	2-7'X5' RCB
9	7'X5' RCB
10	5-12.8'X7.2' Bridge
11	8'x6' RCB
12	2-7'X5' RCB
13	16.7'X8.3' Bridge
14	16.7'X8.3' Bridge
15	2-6'x4' RCB
16	2-8'x6' RCB

FIGURE 4.4
SOUTHERN FAN
PRE-DEVELOPMENT FLOW MAP

January 12, 2010



SILVER STATE PHOTOVOLTAIC POWER PROJECT

N

0 1,700 3,400 Feet

LEGEND

- NV Energy Higgins Power Plant Substation
- Project Boundary
- Outflow Node and ID
- BASIN 1 Mountain Basin Boundary and ID
- Railroad
- State Boundary

Velocity range (ft/s)

- 0.00 - 1.00
- 1.01 - 2.00
- 2.01 - 3.00
- 3.01 - 4.00
- > 4.00

Outflow Nodes Information	
Node	Description
1	6'x4' RCB
2	2-6'x4' RCB
3	2-6'x4' RCB
4	2-6'x4' RCB
5	2-48" CMP
6	7'X5' RCB
7	2-7'X5' RCB
8	2-7'X5' RCB
9	7'X5' RCB
10	5-12.6'X7.2' Bridge
11	6'x6' RCB
12	2-7'X5' RCB
13	16.7'X6.3' Bridge
14	16.7'X6.3' Bridge
15	2-6'x4' RCB
16	2-8'x6' RCB

FIGURE 4.5
SOUTHERN FAN
PRE-DEVELOPMENT VELOCITY MAP

January 12, 2010

4.2.1 Northern Mountain Basin Storm Event

Figure 4.2 is a Flow Map presenting the average flow depths within each node reported in incremental depths of 0.5 feet for a storm event centered over the northern mountain basins. Likewise, Figure 4.3 shows the average velocities in shades of green representing increments of one foot per second.

The Flow Map shows that the flood would be distributed across the entire fan surface as sheet and shallow concentrated flow. The majority of the flow is conveyed as sheet flow at depths less than 0.5 feet. Several bands of shallow concentrated flow are apparent where the flow is conveyed at depths between 0.5 foot and one foot. There are a number of isolated grids throughout the area with flow depths between one and two feet.

With regard to the flow patterns presented on Figure 4.2, it should be noted that the southernmost band of concentrated flow agrees well with the flood zone designate by FEMA on Figures 1.2 and 2.2. In addition, the results of the FLO-2D model agree well with observed washes on the aerial map (see Figure 1.2) and the topographic map (see Figure 4.6).

The Velocity Map, Figure 4.3, indicates that the majority of the flow velocities range between one foot per second and three feet per second. The flow is less than one foot per second on the fringes of the flood. The highest velocities occur near the fan apex and within the bands of concentrated flow.

Twelve sections, labeled as N1 through N12 on Figure 4.2, were taken to evaluate the 100-year flow rates entering and exiting the site of the future solar field. Note that six sections are labeled with the prefix S. The flows in these sections are controlled by a storm event over the southern mountain basin (see Figure 4.4).

The highest flow rates are expected to occur at Sections N5 (916 cfs) and N6 (1096 cfs) at the upstream side of the solar field. As would be expected, the flow distribution becomes more uniform with fewer and narrower bands of concentrated flow in the lower portion of the fan. The majority of the flow from the northern basins drains directly to, and is stored in, Roach Lake (outflow node 0). Only a small amount (23 cfs) drains to a culvert (outflow node 1) under the UPRR tracks.

4.2.2 Southern Mountain Basins Storm Event

Figure 4.4 is a Flow Map presenting the average flow depths within each node reported in incremental depths of 0.5 feet for a storm event centered over the southern mountain basin. Figure 4.5 shows the average velocities in different shades of green representing increments of one foot per second.

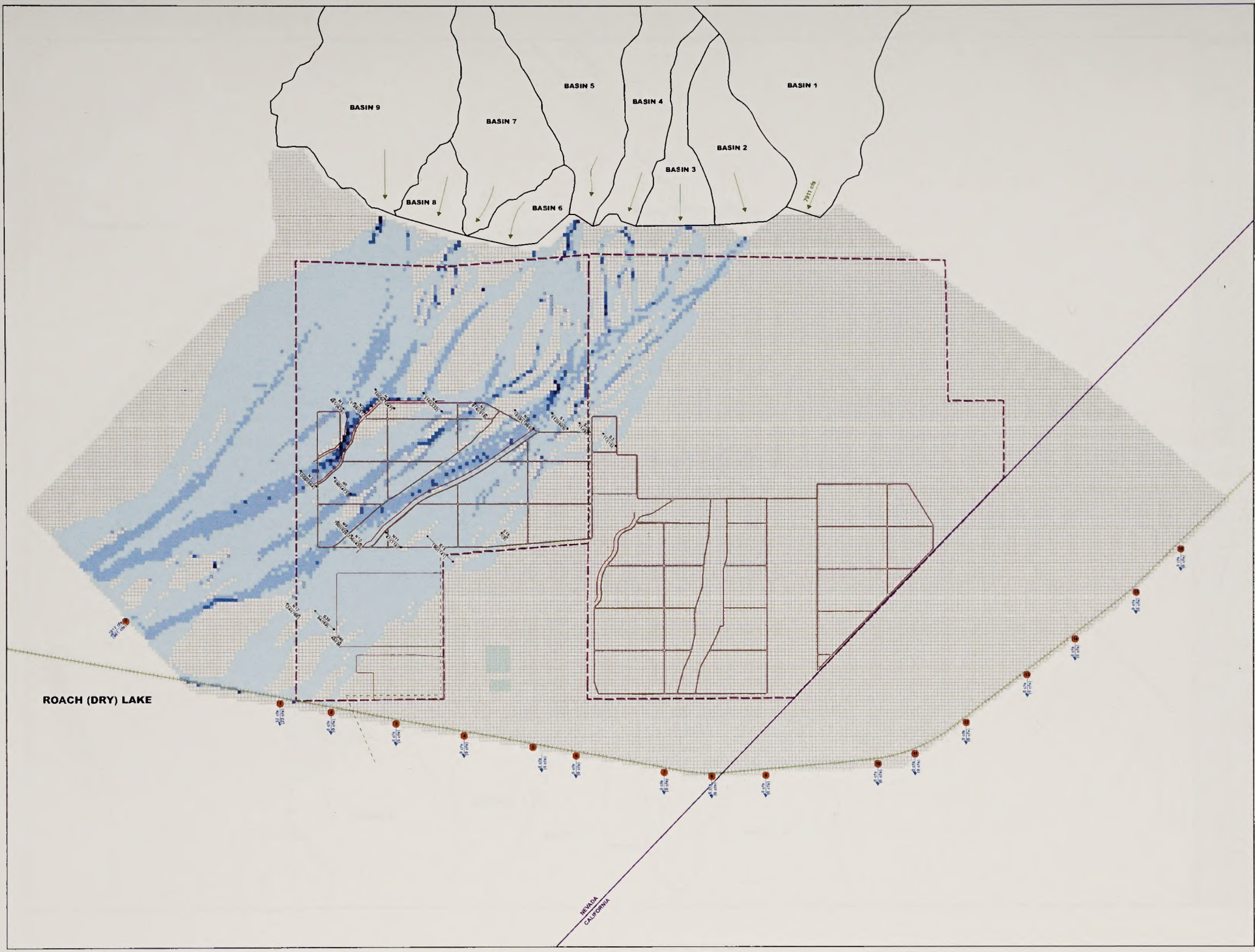
The model shows that a storm over the southern mountain basin produces a flood that is distributed across the entire fan surface. Across the majority of the fan, the flow depth is less than 0.5 feet deep except were concentrated in shallow washes. The velocities in the shallow washes range from 1 ft/s and 4 ft/s. The majority of the flow is conveyed under the UPRR tracks through culverts and bridges. A minor amount, 194 cfs, reaches Roach Lake.

Forty-six sections, labeled as S1 through S46 on Figure 4.4, were taken to evaluate the 100-year flow rates entering and exiting the site of the future solar field. Note that sections labeled with an N-prefix are controlled by a storm in over the northern mountain basins (see Figure 4.2).

More than one-half of the flow travels down in the center of the fan with the highest flow rates at Sections S5 (1,424 cfs) and S6 (1,683 cfs). The washes in which the flow is conveyed show clearly on the aerial photograph (Figure 1.2) and topographic map (Figure 1.3). Flow depths up to 2 feet deep and velocities up to 5 ft/s are expected to occur in these washes.

4.3 FLO-2D Results – Post-Development Conditions

Figures 4.6 through 4.9 present the post-development flow depths and velocities for the northern and southern mountain basins. Pre-development flow depths are also shown on the flow maps for comparison. As expected, the pre- and post-development flow results are similar indicating that the optional berms and tilling will not affect the flow depths and velocities. The difference between pre- and post-development flows is considered insignificant and within the level of accuracy of the proposed contouring, model input and assumptions. In particular, it is important to note that the flow rates and patterns at Roach Lake, the UPRR culverts, and within the designated FEMA flood zone are essentially unchanged.



SILVER STATE PHOTOVOLTAIC POWER PROJECT

N

0 1,500 3,000 Feet

LEGEND

- NV Energy Higgins Power Plant Substation
- Project Boundary
- Outflow Node and ID
- 1 cfs (1 cfs) — Post Conditions Culvert Flow (Existing Conditions Culvert Flow)
- Railroad
- Inflow from Mountain Areas
- BASIN 1 — Mountain Basin Boundary and ID
- S1 190(139) — Section ID, Post Conditions / (Existing Conditions Flow) - cfs
- State Boundary
- Paved Road
- Berm
- Dirt Road

Depth Range (feet)

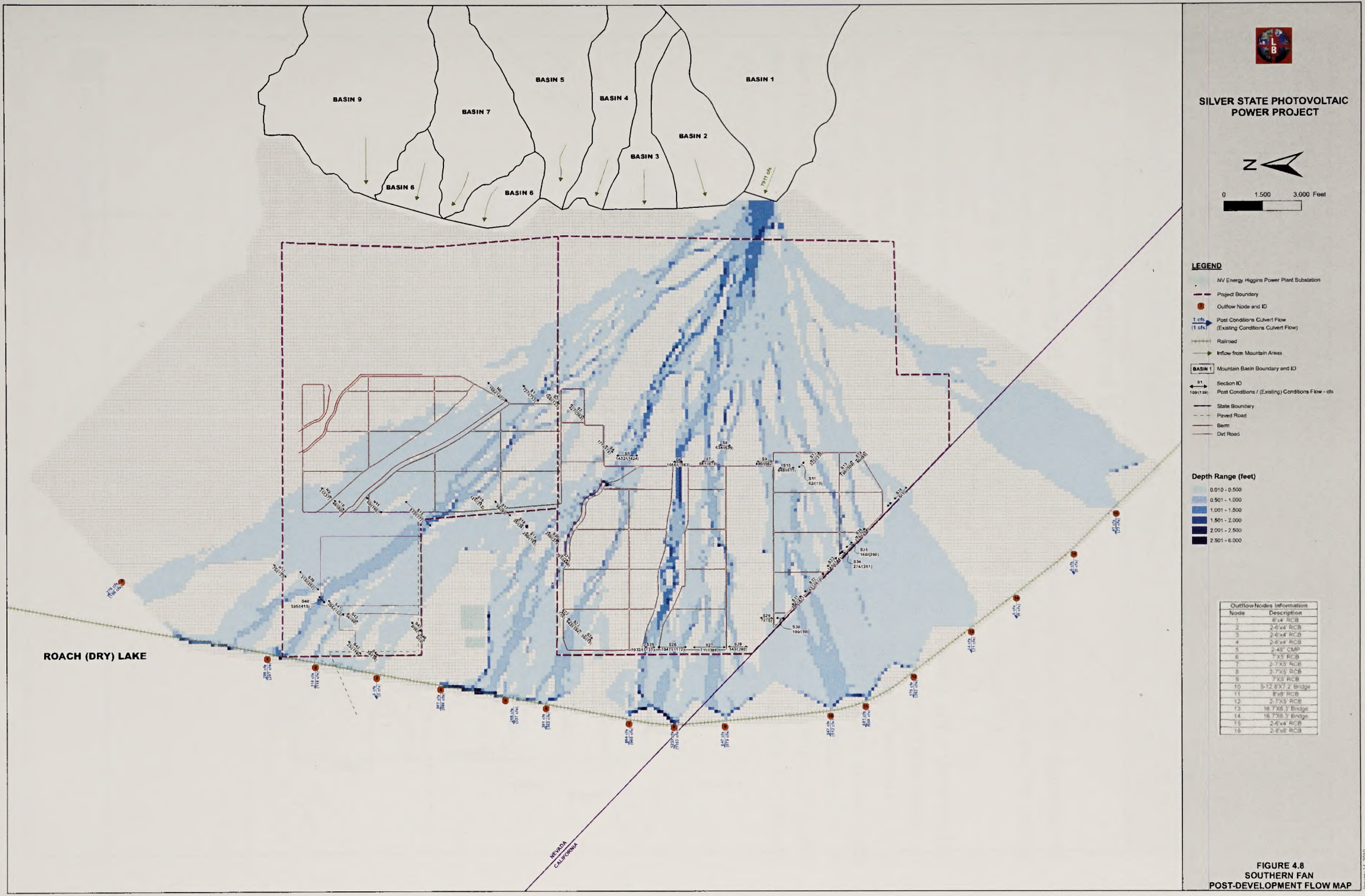
- 0.010 - 0.500
- 0.501 - 1.000
- 1.001 - 1.500
- 1.501 - 2.000
- 2.001 - 2.500
- 2.501 - 6.000

Outflow Nodes Information	
Node	Description
1	6'x4' RCB
2	2-6'x4' RCB
3	2-6'x4' RCB
4	2-6'x4' RCB
5	2-48" CMP
6	7'X5' RCB
7	2-7'X5' RCB
8	2-7'X5' RCB
9	7'X5' RCB
10	5-12.8'X7.2' Bridge
11	8'x6' RCB
12	2-7'X5' RCB
13	18.7'X6.3' Bridge
14	16.7'X6.3' Bridge
15	2-6'x4' RCB
16	2-8'x6' RCB

FIGURE 4.6
NORTHERN FAN
POST-DEVELOPMENT FLOW MAP

January 14, 2010

FIGURE 4.7
NORTHERN FAN
POST-DEVELOPMENT VELOCITY MAP



SILVER STATE PHOTOVOLTAIC POWER PROJECT

N

0 1,500 3,000 Feet

LEGEND

- NV Energy Higgins Power Plant Substation
- Project Boundary
- Outflow Node and ID
- 1 cfs (1 cfs) Post Conditions Culvert Flow (Existing Conditions Culvert Flow)
- Railroad
- Inflow from Mountain Areas
- BASIN 1 Mountain Basin Boundary and ID
- S1 Section ID
- 109/(139) Post Conditions / (Existing) Conditions Flow - cfs
- State Boundary
- Paved Road
- Berm
- Dirt Road

Depth Range (feet)

- 0.010 - 0.500
- 0.501 - 1.000
- 1.001 - 1.500
- 1.501 - 2.000
- 2.001 - 2.500
- 2.501 - 6.000

Outflow Nodes Information	
Node	Description
1	6'x4' RCB
2	2-6'x4' RCB
3	2-6'x4' RCB
4	2-6'x4' RCB
5	2-48" CMP
6	7'X5' RCB
7	2-7'X5' RCB
8	2-7'X5' RCB
9	7'X5' RCB
10	5-12.6'X7.2' Bridge
11	8'x8' RCB
12	2-7'X5' RCB
13	16.7'X8.3' Bridge
14	16.7'X8.3' Bridge
15	2-6'x4' RCB
16	2-8'x8' RCB

FIGURE 4.8
SOUTHERN FAN
POST-DEVELOPMENT FLOW MAP

January 14, 2010

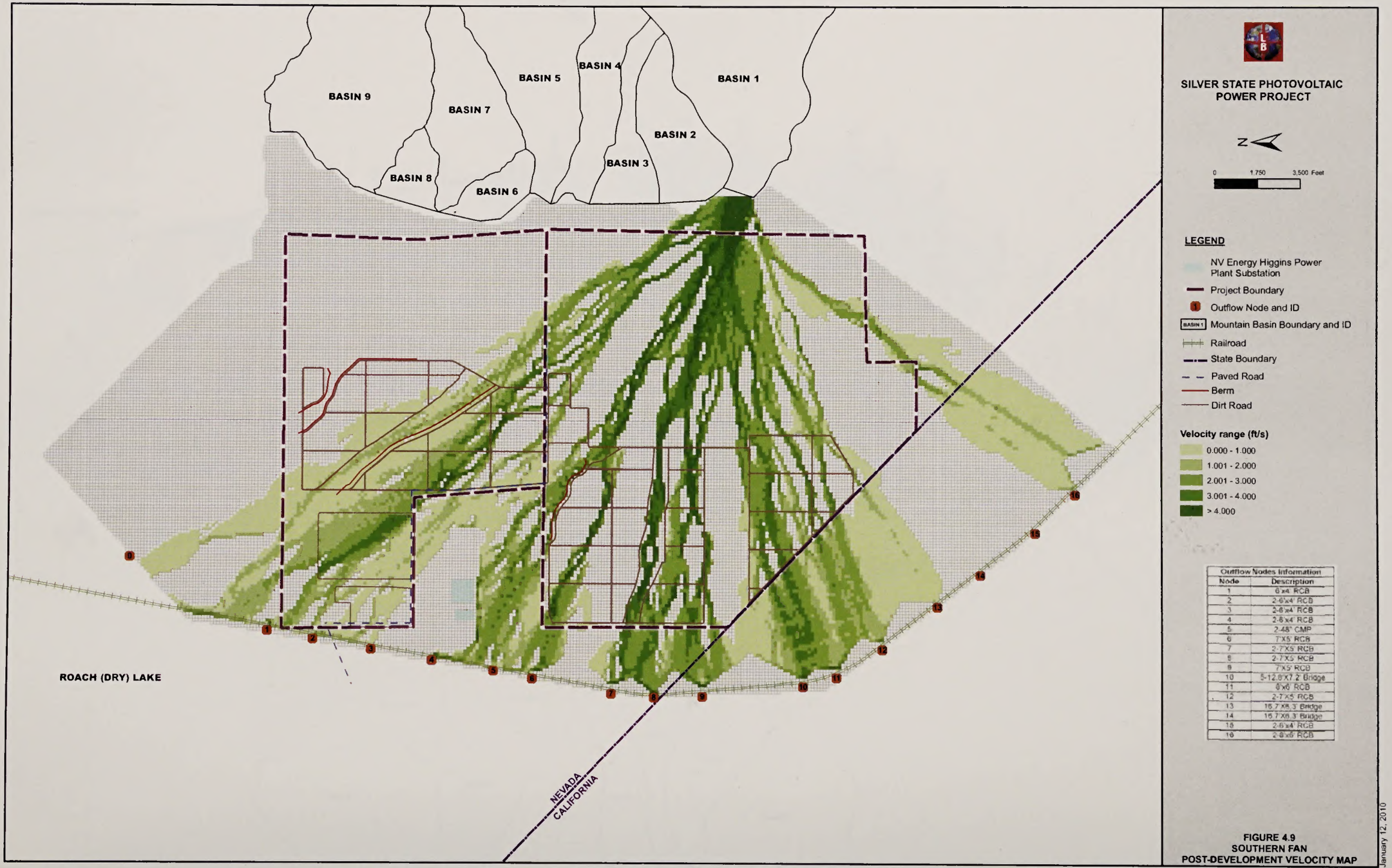


FIGURE 4.9
SOUTHERN FAN
POST-DEVELOPMENT VELOCITY MAP

January 12, 2010

5.0 SCOUR ANALYSIS

This section presents the results of an analysis to estimate the scour at the proposed berms and the PV panels within the solar field.

5.1 Scour Protection of Berms

One concern with the placing of a berm along the alluvial washes is the potential for scour of the berm and of the wash bottom at the berm interface. To protect the berms from erosion, riprap is recommended to be placed as shown on Figure 5.1.

Calculations were conducted using Equation 736 in the Design Manual for determining the average riprap rock size. The calculations were based on an assumed flow depth of 1 foot, berm side slope of 2:1, stability factor of 1.4 for moderate bend curvature, and wash bottom slope of 0.037 ft/ft (see Table 5.1). Based on the calculations, an average rock size (d50) of 12 inches is proposed to protect the berms from erosion and, in accordance with the Design Manual, the riprap should be placed at a thickness of 2 feet which is twice the d50 size. A geotextile fabric should be used as a filter to prevent piping of the berm material through the rock.

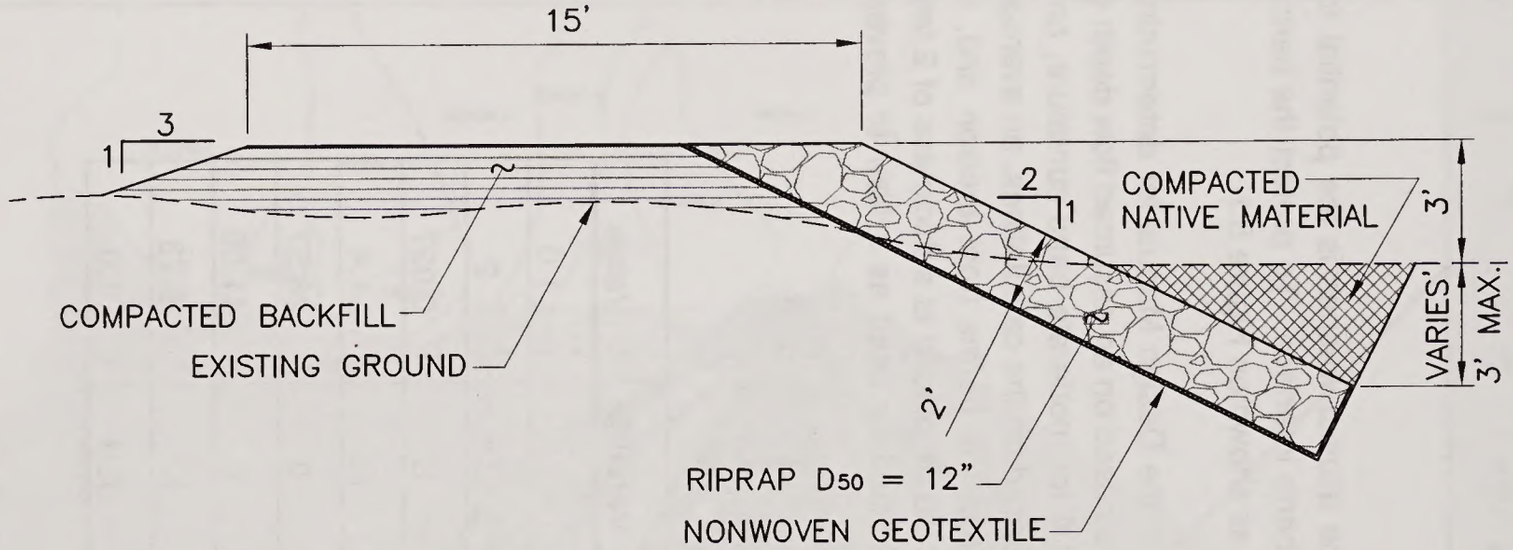
Table 5.1 Riprap Sizing for Berms

Description	Variable	Value
Flow Depth (ft)	y	1.0
Side Slope	Z	2
Channel Slope (ft/ft)	S	0.037
Stability Factor	Fs	1.4
Angle of Side Slope (degrees)	θ	26.57
Angle of Repose (degrees)[1]	ϕ	41.00
Bank Angle Modification Factor[2]	K1	0.73
Rock Size[3]	d50	1.0

[1] Design Manual Figure 705a

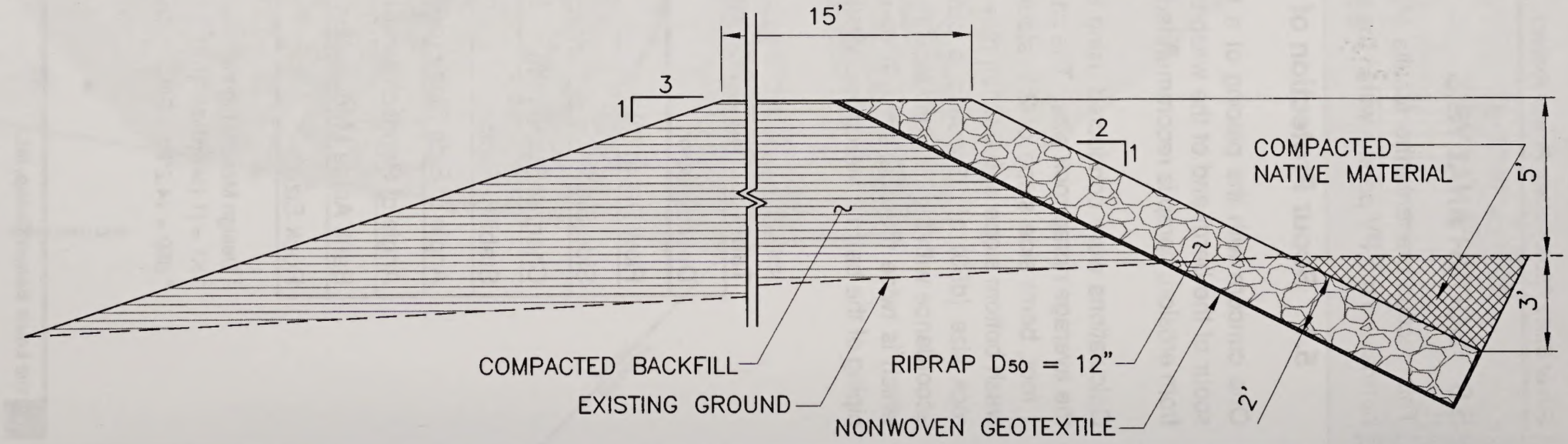
[2] $K1 = (1-(\sin^2(\theta)/\sin^2(\phi)))^{0.5}$ Design Manual Pg. 748

[3] $d50 = 14.2*Fs*y*S/K_1$ Design Manual Eq. 736



TYPICAL INTERIOR BERM SECTION

(NTS)



TYPICAL BOUNDARY BERM SECTION

(NTS)

FIGURE 5.1
TYPICAL BERM SECTIONS

Calculations were also performed to estimate the potential depth of scour at the interface between the riprap and the wash bed using a modified version of the Lacey Equation. The Lacey Equation is a regime equation which was modified by the Bureau of Reclamation (BOR, 1984) to estimate the depth of scour along bankline structures:

$$d_m = 0.47 \left(\frac{Q}{f}\right)^{1/3} \quad (5.1)$$

where: d_m = mean depth at the design discharge (ft)
Q = design discharge, ft^3/s
f = Lacey's silt factor equal to $1.76\ (d50)^{1/2}$, where d50 is millimeters.

The results are then adjusted by an empirical multiplying factor based on the degree of curvature in the wash to obtain the depth of scour (ds). For a straight reach, Z is equal to 0.25, and for a right angle bend, Z is equal to 1.0. For this study, a value of 0.75 was applied which corresponds to severe bend in the wash.

Table 5.2 Toe Scour at Berm

Q	d50	f	dm[1]	z		ds (ft)	
(cfs)	(mm)		(ft)	straight	severe bend	straight	severe bend
500	2	2.5	2.7	0.25	0.75	0.7	2.1
600	2	2.5	2.9	0.25	0.75	0.7	2.2
700	2	2.5	3.1	0.25	0.75	0.8	2.3
800	2	2.5	3.2	0.25	0.75	0.8	2.4
900	2	2.5	3.3	0.25	0.75	0.8	2.5
1000	2	2.5	3.5	0.25	0.75	0.9	2.6
1100	2	2.5	3.6	0.25	0.75	0.9	2.7
1200	2	2.5	3.7	0.25	0.75	0.9	2.8
1300	2	2.5	3.8	0.25	0.75	0.9	2.8
1400	2	2.5	3.9	0.25	0.75	1.0	2.9
1500	2	2.5	4.0	0.25	0.75	1.0	3.0

[1] Equation 6.1

Scour depths were estimated for a range of flow rates from 500 cfs to 1,500 cfs based on an assumed d50 of 2 millimeters, the upper limit of coarse sand. It should be noted that scour depths as noted below can occur due to the design storm event or the cumulative result of several smaller events. The results indicate that the range of scour can be anticipated to be between 2 feet and 3 feet at a severe bend and 0.7 feet to 1.0

feet for straight sections (See Table 5.2). The detailed design will need to consider that severe bends could occur along straight reaches due to the wandering nature of storm water flow in the washes.

5.2 Scour at PV Panel Foundation

Flooding will still occur throughout the majority of the solar field where PV panels will be installed and scour at the panel foundations is a concern. Calculations were performed to estimate the potential depth of local scour during a flood to assist with the selection and depth of the panel foundation.

The basic mechanism causing local scour around an obstruction, such as a pier or panel foundation, are flow jets which result from the backup of water on the upstream edge and subsequent acceleration of the flow around the nose of the obstruction. To estimate local scour in this study, Equation 719 of the Design Manual was used (see Table 5.3). This equation was adopted from HEC No. 18 and was originally developed by Colorado State University (CSU). Correction factors were applied to account for the shape of the obstruction, angle of attack of the flow, bed condition, and degree of bed armoring.

The types of foundations expected to be used on the Silver State Project consist of steel posts (W6 x 9) having dimensions of 6 inches by 4 inches and 2.75 foot wide concrete ballasts (see Figure 1.2). Local scour calculations were performed for a range of velocities from 1 ft/s to 5 ft/s and assuming a flow depth of 1 foot. From the results, it can be seen that Equation 719 is sensitive to the width of the obstruction. The scour depth for the concrete ballast is 2.75 times the scour depth for the steel post.

Table 5.3 PV Panel Foundation Scour Calculations

Correction Factor for Nose Shape[1]	Correction Factor for Angle of Attack of Flow[2]	Correction Factor for Bed Condition[3]	Correction Factor for Armoring of Bed Material[4]	Pier Width	Upstream Flow Depth	Upstream Velocity	Froude Number	Local Scour[5]
K1	K2	K3	K4	a (ft)	y_1 (ft)	v_1 (ft/s)	Fr_1	ys (ft)
Steel Post (W6 x 9 wide flange post)								
1.1	1.0	1.1	1.0	0.50	1.0	1.0	0.2	0.7
1.1	1.0	1.1	1.0	0.50	1.0	2.0	0.4	1.0
1.1	1.0	1.1	1.0	0.50	1.0	3.0	0.5	1.2
1.1	1.0	1.1	1.0	0.50	1.0	4.0	0.7	1.3
1.1	1.0	1.1	1.0	0.50	1.0	5.0	0.9	1.5
Concrete Ballast (2.75 feet wide)								
1.0	1.0	1.1	1.0	2.75	1.0	1.0	0.2	2.0
1.0	1.0	1.1	1.0	2.75	1.0	2.0	0.4	2.7
1.0	1.0	1.1	1.0	2.75	1.0	3.0	0.5	3.2
1.0	1.0	1.1	1.0	2.75	1.0	4.0	0.7	3.7
1.0	1.0	1.1	1.0	2.75	1.0	5.0	0.9	4.0

[1] K1 = 1.1 for square nose and 1.0 for round.

[2] Assumed to be zero degrees

[3] Assumed to be clear water scour

[4] No armoring of the scour hole was assumed to occur.

[5] Equation 719 of the Design Manual $ys=2*K1*K2*K3*K4*a^{0.65}*y^{0.35}*Fr^{0.43}$

6.0 CONCLUSIONS

Information presented in this study is preliminary and intended to give an estimate of the anticipated flow conditions at the site. Across the majority of the project, flooding is expected to occur as sheet and shallow concentrated flows with average depths between 0.5 feet and 2.5 feet. Velocities will range between 1 ft/s per second and 5 ft/s. However, it is important to note these are average values based on a 125 foot grid model and local conditions may result in flow depths and velocities that are greater than predicted by the model. Where PV panels are proposed to be constructed in areas of high risk outside of the designated flow corridors, special consideration will be required to ensure that solar panels and equipment are elevated sufficiently above the flood depth. Local flow depths, velocities, and scour will need to be evaluated in more detail during the final design phases of the project.

Four high risk flow corridors are proposed to be left undisturbed and undeveloped in order to preserve the natural drainage of the site. As an option, low berms are proposed at selected locations along the boundaries of the flow corridors to secure the banks, and prevent flow from breaking out into the solar field. The berms have an insignificant effect on the flow depths and velocities in the washes, and if eliminated, would not change the results or conclusions of this study. The model also showed that the flow rates at Roach Lake, the UPRR culverts, and within the designated FEMA flood zone would be essentially unchanged as a result of the site development. Therefore, it can be concluded that the natural flow conditions would be perpetuated through the site if constructed as proposed.

Two types of foundations for the PV panels are proposed, steel post and concrete ballasts. Foundations should be designed such that the PV panel is elevated above the anticipated flood level. It is recommended that concrete ballasts are not placed where alluvial fan flooding is expected to occur and should be limited to use on geologic surfaces greater than 1,000 years old. Steel posts foundations in flood prone areas should be designed for additional depth to account for the unsupported pile length after anticipated scour. A monitoring and maintenance plan that repairs local scour should also be considered. The plan would provide guidance to ensure that PV supports remain in a stable and operable condition and are not compromised by local scour. The design should consider the potential for impact by large boulders and other debris that may be carried by the flow.

7.0 REFERENCES

1. BOR, 1984. *Computing Degradation and Local Scour, Technical Guideline for Bureau of Reclamation*, U.S. Department of the Interior, by Ernest L. Pemberton and Joseph M. Lara, Denver, Colorado, January, 1984, 48 pages.

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3. CCRFCD, 1999. *Hydrologic Criteria and Drainage Design Manual.* Prepared by WRC, Inc. and Updated by Montgomery Watson for Clark County Regional Flood Control District, August 1999, www.ccrfcd.org.

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6. FEMA, 1990. *FAN An Alluvial Fan Flooding Computer Program.* Prepared by Risk Studies Division, Office of Risk Assessment, Federal Insurance Administration, Federal Emergency Management Agency, September 1990, www.fema.gov.

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APPENDIX A
HYDROLOGIC PARAMETERS AND ANALYSIS

A.1 Precipitation

A.2 Lag Time Calculations

A.3 Curve Number Calculations

A.4 HEC-1 Model Output – 100-year, 6-hour Event

A.1 Precipitation

RAINFALL DEPTH-DURATION-FREQUENCY
100-YEAR, 6-HOUR
(DEPTHS IN TENTHS OF INCHES)

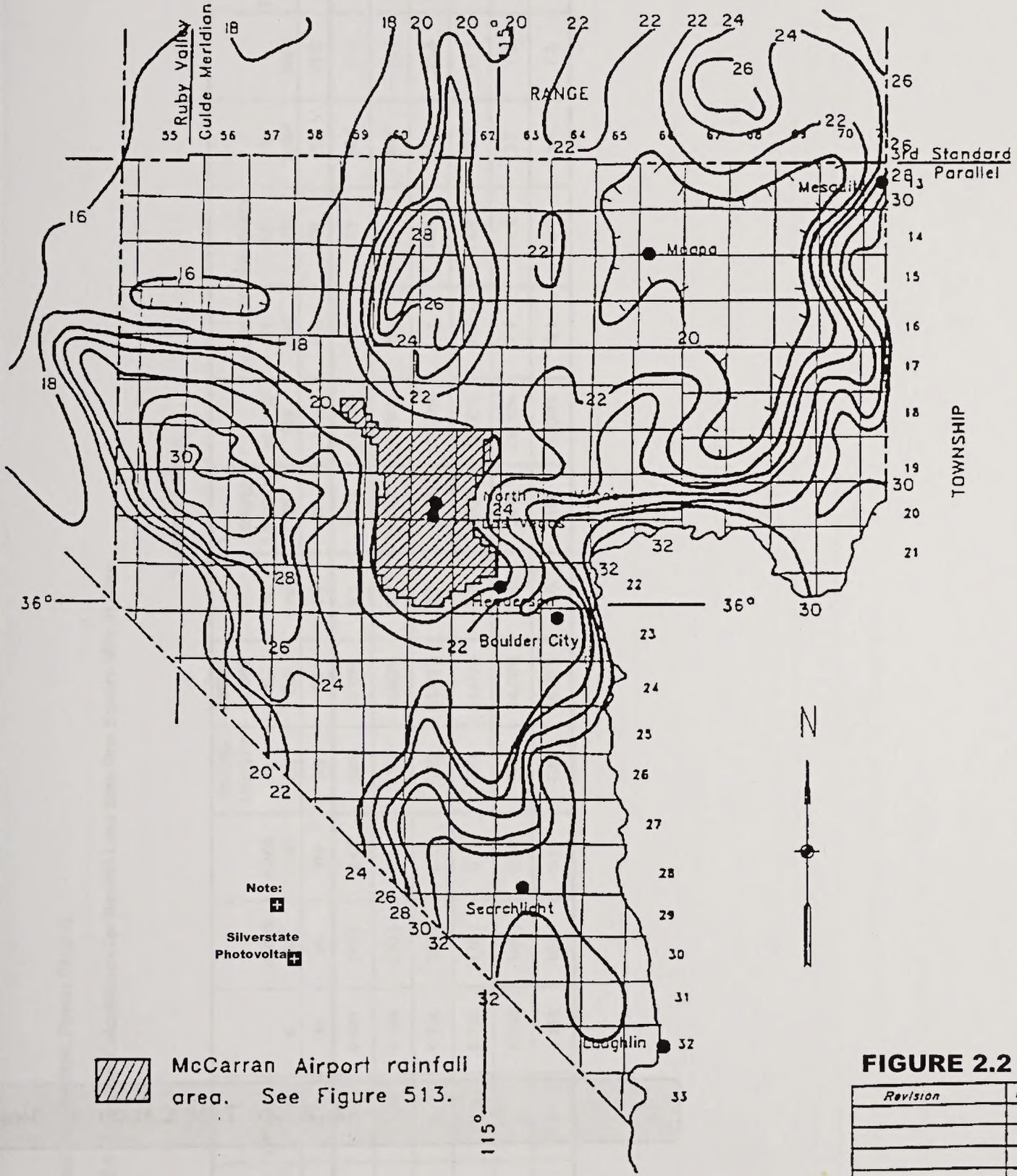

FIGURE 2.2 B

Revision	Date

WRC ENGINEERING	REFERENCE: NOAA ATLAS 2, VOLUME VII NEVADA, 1973	FIGURE 506

A.2 Lag Time Calculations

Silver State Photovoltaic Power Project

Table A.2.1 - Lag Time Calculations for Basins Less than One Square Mile in Area

Standard Form 4

BASIN	DEV./UN. (D or U)	K	AREA (Ac)	AREA (mi2)	INITIAL LENGTH L_0 (ft)	INITIAL SLOPE S_0 (%)	t_i (min)	TRAVEL LENGTH (ft)	SLOPE (%)	VELOCITY V1 (ft/s)	VELOCITY V2 (ft/s)	t_t (min)	t_c (min)	Tc CHECK (min)	Tlag (hours)	CN
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)
2	U	0.681	348.5	0.54	500	37.00%	5.1	7821	20.00%	6.6	13.1	10.5	15.6	N/A	0.156	81.1
3	U	0.756	220.7	0.34	500	46.00%	3.9	8043	20.00%	6.6	13.1	10.8	14.7	N/A	0.147	86.8
4	U	0.756	339.0	0.53	500	53.00%	3.7	9501	23.00%	7.1	14.1	11.8	15.5	N/A	0.155	86.8
6	U	0.750	476.2	0.74	500	51.00%	3.8	9909	19.00%	6.5	12.8	13.5	17.3	N/A	0.173	86.4
8	U	0.750	128.3	0.20	500	44.00%	4.0	2445	25.00%	7.4	14.7	3.3	7.3	N/A	0.100	86.4
9	U	0.756	121.1	0.19	500	59.00%	3.6	3166	30.00%	8.1	16.1	3.8	7.3	N/A	0.100	86.8

Silver State Photovoltaic Power Project

Table A.2.2 - Column Calculation Explanations for Table A.2.1

Column	Parameter	Description	Units	Formula/Source
1		Hydrologic Basin Name (Input into KK Card in HEC-1 Model)	-	See Drainage Basin Map
2		Developed or Undeveloped	-	Assumed fully developed in future
3	K	Flow Resistance Coefficient	-	K = 0.0132 (CN) - 0.039 DM, Eq. 603)
4	A	Area	acres	
5	A	Area (Input into BA card in HEC-1)	mi^2	
6	L_0	Initial Travel Length	ft	
7	S_0	Initial Slope	-	
8	Ti	Initial Travel Time	minutes	Ti = 1.8 (1.1 - R) $L_0^{1/2}$ / $S_0^{1/3}$ DM, Eq. 602)
9	L	Overland Travel Length	ft	
10	S	Overland Slope	-	
11	V1	Velocity (initial)	ft/sec	DM Section 602.1
12	V2	Velocity (final)	ft/sec	DM Section 602.1
13	Tt	Overland Travel Time	minutes	Tt = (L - L_0) / (V*60)
14	Tc	Total Travel Time	minutes	Tc = Ti + Tt
15	Tc Check	Maximum Time of Concentration for Urbanized Basins	minutes	Tc Check = L/180 + 10 DM, Eq. 604)
16	Tlag	Lag Time (Input into UD card in HEC-1)	hours	Tlag = (lesser of Tc and Tcheck) * 0.6 / 60 DM, Eq. 612)
17	CN	SCS Curve Number (Input into LS Card in HEC-1 Model)		

References:

1. DM - Clark County Hydrologic Criteria and Drainage Design Manual, WRC, August, 1999

Silver State Photovoltaic Power Project

Table A.2.3 - Lag Time Calculations for Basins Greater than One Square Mile in Area
USBR Method

Basin ID	Manning's Roughness Kn	Length of Longest Watercourse L mile	Length to Centroid Lc mile	Average Slope S ft/mile	Lag Time TLAG hours
1	0.04	7.86	4.0	375	0.938
5	0.04	2.31	1.3	889	0.374
7	0.04	1.88	1.2	1191	0.328

$TLAG = 20\ Kn\ (L\ L_c / S^{0.5})^{0.33}$

A.3 Curve Number Calculations

SILVER STATE PHOTOVOLTAIC POWER PROJECT
TABLE A.3.1. Curve Number Calculations

Basin ID	Soil Type	Area [sf]	Area [acres]	CN	CN*Area [acres]	Total area [smi]
BASIN 1	700	97330229	2234	88	196627	
	380	8008036	184	63	11582	
	690	136368203	3131	85	266100	
	701	47877111	1099	88	96721	
	790	99731122	2290	88	201477	
	143	20867201	479	88	42156	
	680	27099552	622	63	39194	
	701	1847044	42	88	3731	
	700	1025489	24	88	2072	
	701	228811	5	88	462	
	701	36852096	846	88	74449	
	143	2938153	67	88	5936	
	Total:	**480173046**	**11023**	**85**	**940506**	**17.2**
BASIN 2	380	4799931	110	63	6942	
	701	619884	14	88	1252	
	143	74134	2	88	150	
	143	9687330	222	88	19570	
	Total:	**15181279**	**349**	**80**	**27914**	**0.54**
BASIN 3	143	14688	0	88	30	
	701	1276288	29	88	2578	
	143	6274575	144	88	12676	
	380	1870517	43	63	2705	
	380	177655	4	63	257	
	Total:	**9613723**	**221**	**83**	**18246**	**0.34**
BASIN 4	380	727402	17	63	1052	
	701	3970097	91	88	8020	
	143	10065557	231	88	20334	
	380	1808	0	63	3	
	Total:	**14764865**	**339**	**87**	**29410**	**0.53**
BASIN 5	380	426777	10	63	617	
	701	32869981	755	88	66404	
	143	6636988	152	88	13408	
	380	1808	0	63	3	
	Total:	**39935555**	**917**	**88**	**80432**	**1.43**
BASIN 6	380	1362218	31	63	1970	
	701	17583833	404	88	35523	
	143	1798270	41	88	3633	
	Total:	**20744321**	**476**	**86**	**41126**	**0.74**
BASIN 7	380	2040509	47	63	2951	
	701	42623867	979	88	86109	
	680	686101	16	63	992	
	Total:	**45350477**	**1041**	**86**	**90052**	**1.63**

SOIL	HGN	CN
143	D	88
380	A	63
391	A	63
500	B	77
680	A	63
690	C	85
700	D	88
701	D	88
790	D	88

Basin ID	Soil Type	Area [sf]	Area [acres]	CN	CN*Area [acres]	Total area [smi]
BASIN 8	380	357079	8	63	516	
	143	5231478	120	88	10569	
	Total:	**5588557**	**128**	**86**	**11085**	**0.20**
BASIN 9	380	254440	6	63	368	
	701	5021571	115	88	10145	
	Total:	**5276011**	**121**	**87**	**10513**	**0.19**

A.4 HEC-1 Model Output – 100-year, 6-hour Event

```
1****************************************
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 *                                      *                                        *
 *                                      *                                        *
 *   FLOOD HYDROGRAPH PACKAGE  (HEC-1)  *                                        *   U.S. ARMY CORPS OF ENGINEERS
 *                                      *                                        *
 *              JUN   1998              *                                        *   HYDROLOGIC ENGINEERING CENTER
 *                                      *                                        *
 *           VERSION 4.1                *                                        *        609 SECOND STREET
 *                                      *                                        *
 *                                      *                                        *      DAVIS, CALIFORNIA 95616
 *                                      *                                        *
 *  RUN DATE   13NOV09  TIME  17:33:50  *                                        *          (916) 756-1104
 *                                      *                                        *
 *                                      *                                        *
 ****************************************
****************************************
```

```
X     X  XXXXXXX   XXXXX           X
X     X  X        X     X         XX
X     X  X        X                X
XXXXXXX  XXXX     X        XXXXX   X
X     X  X        X                X
X     X  X        X     X          X
X     X  XXXXXXX   XXXXX           XXX
```

THIS PROGRAM REPLACES ALL PREVIOUS VERSIONS OF HEC-1 KNOWN AS HEC1 (JAN 73), HEC1GS, HEC1DB, AND HEC1KW.

THE DEFINITIONS OF VARIABLES -RTIMP- AND -RTIOR- HAVE CHANGED FROM THOSE USED WITH THE 1973-STYLE INPUT STRUCTURE.
THE DEFINITION OF -AMSKK- ON RM-CARD WAS CHANGED WITH REVISIONS DATED 28 SEP 81. THIS IS THE FORTRAN77 VERSION
NEW OPTIONS: DAMBREAK OUTFLOW SUBMERGENCE , SINGLE EVENT DAMAGE CALCULATION, DSS:WRITE STAGE FREQUENCY,
DSS:READ TIME SERIES AT DESIRED CALCULATION INTERVAL LOSS RATE:GREEN AND AMPT INFILTRATION
KINEMATIC WAVE: NEW FINITE DIFFERENCE ALGORITHM

1 HEC-1 INPUT PAGE 1

```
          LINE          ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

                        *DIAGRAM
 *** FREE ***
               1        ID
               2        ID
               3        ID
               4        ID   SILVER STATE PHOTOVOLTAIC POWER PROJECT
               5        ID
               6        ID
               7        ID   STORM 1 - NORTHERN MOUNTAIN AREA BASINS 2 THROUGH 9
               8        ID
               9        ID   100-YEAR 6-HOUR STORM EVENT HEC-1 MODEL
              10        ID   SDN3 STORM DISTRIBUTION
              11        ID
              12        ID   OUTPUT FILE NAME: SS3100H.OUT
              13        ID
              14        ID     JR CARDS REPRESENT DEPTH AREA REDUCTION FACTORS (DARF) BASED ON THE
              15        ID        FOLLOWING VALUES:
              16        ID
              17        ID    AREA (SQUARE MILES)    DARF
              18        ID    5.6                    0.90
              19        ID
              20        IT       5       0       0     300
              21        IN       5       0       0
              22        IO       0
              23        JR    PREC    0.90
                        *
              24        KK       2
              25        BA    0.54
              26        PB    3.43
              27        PC   0.000   0.020   0.057   0.070   0.087   0.108   0.124   0.130   0.130   0.130
              28        PC   0.130   0.130   0.130   0.133   0.140   0.142   0.148   0.158   0.172   0.181
              29        PC   0.190   0.197   0.199   0.200   0.201   0.204   0.214   0.229   0.241   0.249
              30        PC   0.251   0.256   0.270   0.278   0.281   0.283   0.295   0.322   0.352   0.409
              31        PC   0.499   0.590   0.710   0.744   0.781   0.812   0.819   0.835   0.851   0.856
              32        PC   0.860   0.868   0.876   0.888   0.910   0.926   0.937   0.950   0.970   0.976
              33        PC   0.982   0.985   0.987   0.989   0.990   0.993   0.993   0.994   0.995   0.998
              34        PC   0.998   0.999   1.000
              35        LS       0    80.1
              36        UD   0.156
                        *
              37        KK       3
              38        BA    0.34
              39        LS       0    82.7
              40        UD   0.147
                        *
              41        KK       4
              42        BA    0.53
              43        LS       0    86.8
              44        UD   0.155
```

1 HEC-1 INPUT PAGE 2

```
          LINE          ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

            45          KK       5
            46          BA    1.43
            47          LS       0    87.7
            48          UD   0.374
                        *

            49          KK       6
            50          BA    0.20
            51          LS       0    86.4
            52          UD   0.100
                        *

            53          KK       7
            54          BA    0.74
            55          LS       0    86.4
            56          UD   0.173
                        *

            57          KK       8
            58          BA    0.19
            59          LS       0    86.8
            60          UD   0.100
                        *

            61          KK       9
            62          BA    1.63
            63          LS       0    86.5
            64          UD   0.328
                        *
            65          ZZ
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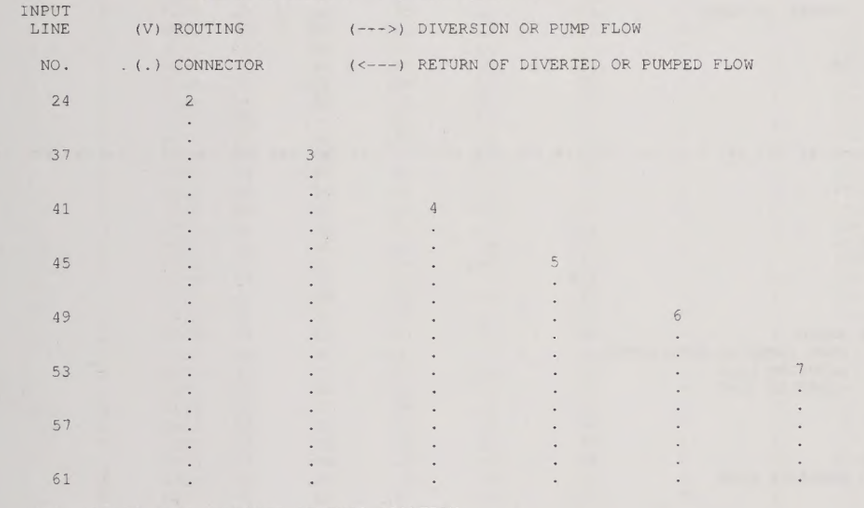
1 SCHEMATIC DIAGRAM OF STREAM NETWORK



(***) RUNOFF ALSO COMPUTED AT THIS LOCATION

1

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*****************************************
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*                                       *                                       *
*                                       *                                       *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *                                       *    U.S. ARMY CORPS OF ENGINEERS
*                                       *                                       *
*               JUN   1998              *                                       *    HYDROLOGIC ENGINEERING CENTER
*                                       *                                       *
*            VERSION 4.1                *                                       *          609 SECOND STREET
*                                       *                                       *
*                                       *                                       *       DAVIS, CALIFORNIA 95616
*                                       *                                       *
*  RUN DATE   13NOV09  TIME  17:33:50   *                                       *           (916) 756-1104
*                                       *                                       *
*                                       *                                       *
*****************************************
*****************************************
```

SILVER STATE PHOTOVOLTAIC POWER PROJECT

STORM 1 - NORTHERN MOUNTAIN AREA BASINS 2 THROUGH 9

100-YEAR 6-HOUR STORM EVENT HEC-1 MODEL

SDN3 STORM DISTRIBUTION

OUTPUT FILE NAME: SS3100H.OUT

JR CARDS REPRESENT DEPTH AREA REDUCTION FACTORS (DARF) BASED ON THE FOLLOWING VALUES:

AREA (SQUARE MILES)	DARF
5.6	0.90

22 IO OUTPUT CONTROL VARIABLES

IPRNT	0	PRINT CONTROL
IPLOT	0	PLOT CONTROL
QSCAL	0.	HYDROGRAPH PLOT SCALE

IT HYDROGRAPH TIME DATA

NMIN		5	MINUTES IN COMPUTATION INTERVAL
IDATE	1	0	STARTING DATE
ITIME		0000	STARTING TIME
NQ		300	NUMBER OF HYDROGRAPH ORDINATES
NDDATE	2	0	ENDING DATE
NDTIME		0055	ENDING TIME
ICENT		19	CENTURY MARK

COMPUTATION INTERVAL .08 HOURS
TOTAL TIME BASE 24.92 HOURS

ENGLISH UNITS

DRAINAGE AREA	SQUARE MILES
PRECIPITATION DEPTH	INCHES
LENGTH, ELEVATION	FEET
FLOW	CUBIC FEET PER SECOND
STORAGE VOLUME	ACRE-FEET
SURFACE AREA	ACRES
TEMPERATURE	DEGREES FAHRENHEIT

JP MULTI-PLAN OPTION
NPLAN 1 NUMBER OF PLANS

JR MULTI-RATIO OPTION
RATIOS OF PRECIPITATION
.90

*** *** *** *

HYDROGRAPH AT STATION 2

DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q	DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q
1		0000	1	.00	.00	.00	0.	1		1230	151	.00	.00	.00	0.
1		0005	2	.07	.07	.00	0.	1		1235	152	.00	.00	.00	0.
1		0010	3	.13	.13	.00	0.	1		1240	153	.00	.00	.00	0.
1		0015	4	.04	.04	.00	0.	1		1245	154	.00	.00	.00	0.
1		0020	5	.06	.06	.00	0.	1		1250	155	.00	.00	.00	0.
1		0025	6	.07	.07	.00	0.	1		1255	156	.00	.00	.00	0.
1		0030	7	.05	.05	.00	0.	1		1300	157	.00	.00	.00	0.
1		0035	8	.02	.02	.00	0.	1		1305	158	.00	.00	.00	0.
1		0040	9	.00	.00	.00	0.	1		1310	159	.00	.00	.00	0.
1		0045	10	.00	.00	.00	0.	1		1315	160	.00	.00	.00	0.
1		0050	11	.00	.00	.00	0.	1		1320	161	.00	.00	.00	0.
1		0055	12	.00	.00	.00	0.	1		1325	162	.00	.00	.00	0.
1		0100	13	.00	.00	.00	0.	1		1330	163	.00	.00	.00	0.
1		0105	14	.01	.01	.00	0.	1		1335	164	.00	.00	.00	0.
1		0110	15	.02	.02	.00	0.	1		1340	165	.00	.00	.00	0.
1		0115	16	.01	.01	.00	0.	1		1345	166	.00	.00	.00	0.
1		0120	17	.02	.02	.00	0.	1		1350	167	.00	.00	.00	0.
1		0125	18	.03	.03	.00	0.	1		1355	168	.00	.00	.00	0.
1		0130	19	.05	.05	.00	2.	1		1400	169	.00	.00	.00	0.
1		0135	20	.03	.03	.00	5.	1		1405	170	.00	.00	.00	0.
1		0140	21	.03	.03	.00	8.	1		1410	171	.00	.00	.00	0.
1		0145	22	.02	.02	.00	10.	1		1415	172	.00	.00	.00	0.
1		0150	23	.01	.01	.00	10.	1		1420	173	.00	.00	.00	0.
1		0155	24	.00	.00	.00	8.	1		1425	174	.00	.00	.00	0.
1		0200	25	.00	.00	.00	5.	1		1430	175	.00	.00	.00	0.
1		0205	26	.01	.01	.00	4.	1		1435	176	.00	.00	.00	0.
1		0210	27	.03	.03	.01	6.	1		1440	177	.00	.00	.00	0.
1		0215	28	.05	.04	.01	14.	1		1445	178	.00	.00	.00	0.
1		0220	29	.04	.03	.01	24.	1		1450	179	.00	.00	.00	0.
1		0225	30	.03	.02	.01	29.	1		1455	180	.00	.00	.00	0.
1		0230	31	.01	.01	.00	27.	1		1500	181	.00	.00	.00	0.
1		0235	32	.02	.01	.00	21.	1		1505	182	.00	.00	.00	0.
1		0240	33	.05	.04	.01	22.	1		1510	183	.00	.00	.00	0.
1		0245	34	.03	.02	.01	30.	1		1515	184	.00	.00	.00	0.
1		0250	35	.01	.01	.00	31.	1		1520	185	.00	.00	.00	0.
1		0255	36	.01	.00	.00	24.	1		1525	186	.00	.00	.00	0.
1		0300	37	.04	.03	.01	22.	1		1530	187	.00	.00	.00	0.
1		0305	38	.09	.06	.03	40.	1		1535	188	.00	.00	.00	0.
1		0310	39	.10	.06	.04	77.	1		1540	189	.00	.00	.00	0.
1		0315	40	.20	.11	.08	135.	1		1545	190	.00	.00	.00	0.
1		0320	41	.31	.15	.16	249.	1		1550	191	.00	.00	.00	0.
1		0325	42	.31	.13	.18	419.	1		1555	192	.00	.00	.00	0.
1		0330	43	.41	.14	.27	612.	1		1600	193	.00	.00	.00	0.
1		0335	44	.12	.04	.08	729.	1		1605	194	.00	.00	.00	0.
1		0340	45	.13	.04	.09	644.	1		1610	195	.00	.00	.00	0.
1		0345	46	.11	.03	.08	507.	1		1615	196	.00	.00	.00	0.
1		0350	47	.02	.01	.02	396.	1		1620	197	.00	.00	.00	0.
1		0355	48	.05	.01	.04	281.	1		1625	198	.00	.00	.00	0.
1		0400	49	.05	.01	.04	214.	1		1630	199	.00	.00	.00	0.
1		0405	50	.02	.00	.01	179.	1		1635	200	.00	.00	.00	0.
1		0410	51	.01	.00	.01	131.	1		1640	201	.00	.00	.00	0.
1		0415	52	.03	.01	.02	94.	1		1645	202	.00	.00	.00	0.
1		0420	53	.03	.01	.02	84.	1		1650	203	.00	.00	.00	0.
1		0425	54	.04	.01	.03	89.	1		1655	204	.00	.00	.00	0.
1		0430	55	.08	.02	.06	115.	1		1700	205	.00	.00	.00	0.
1		0435	56	.05	.01	.04	154.	1		1705	206	.00	.00	.00	0.
1		0440	57	.04	.01	.03	167.	1		1710	207	.00	.00	.00	0.
1		0445	58	.04	.01	.03	155.	1		1715	208	.00	.00	.00	0.
1		0450	59	.07	.02	.05	156.	1		1720	209	.00	.00	.00	0.
1		0455	60	.02	.00	.02	161.	1		1725	210	.00	.00	.00	0.
1		0500	61	.02	.00	.02	135.	1		1730	211	.00	.00	.00	0.
1		0505	62	.01	.00	.01	99.	1		1735	212	.00	.00	.00	0.
1		0510	63	.01	.00	.01	70.	1		1740	213	.00	.00	.00	0.
1		0515	64	.01	.00	.01	48.	1		1745	214	.00	.00	.00	0.
1		0520	65	.00	.00	.00	34.	1		1750	215	.00	.00	.00	0.
1		0525	66	.01	.00	.01	27.	1		1755	216	.00	.00	.00	0.
1		0530	67	.00	.00	.00	23.	1		1800	217	.00	.00	.00	0.
1		0535	68	.00	.00	.00	17.	1		1805	218	.00	.00	.00	0.
1		0540	69	.00	.00	.00	13.	1		1810	219	.00	.00	.00	0.
1		0545	70	.01	.00	.01	14.	1		1815	220	.00	.00	.00	0.
1		0550	71	.00	.00	.00	17.	1		1820	221	.00	.00	.00	0.
1		0555	72	.00	.00	.00	14.	1		1825	222	.00	.00	.00	0.
1		0600	73	.00	.00	.00	12.	1		1830	223	.00	.00	.00	0.
1		0605	74	.00	.00	.00	10.	1		1835	224	.00	.00	.00	0.
1		0610	75	.00	.00	.00	7.	1		1840	225	.00	.00	.00	0.
1		0615	76	.00	.00	.00	3.	1		1845	226	.00	.00	.00	0.
1		0620	77	.00	.00	.00	2.	1		1850	227	.00	.00	.00	0.
1		0625	78	.00	.00	.00	1.	1		1855	228	.00	.00	.00	0.
1		0630	79	.00	.00	.00	0.	1		1900	229	.00	.00	.00	0.
1		0635	80	.00	.00	.00	0.	1		1905	230	.00	.00	.00	0.
1		0640	81	.00	.00	.00	0.	1		1910	231	.00	.00	.00	0.
1		0645	82	.00	.00	.00	0.	1		1915	232	.00	.00	.00	0.
1		0650	83	.00	.00	.00	0.	1		1920	233	.00	.00	.00	0.
1		0655	84	.00	.00	.00	0.	1		1925	234	.00	.00	.00	0.
1		0700	85	.00	.00	.00	0.	1		1930	235	.00	.00	.00	0.
1		0705	86	.00	.00	.00	0.	1		1935	236	.00	.00	.00	0.
1		0710	87	.00	.00	.00	0.	1		1940	237	.00	.00	.00	0.
1		0715	88	.00	.00	.00	0.	1		1945	238	.00	.00	.00	0.
1		0720	89	.00	.00	.00	0.	1		1950	239	.00	.00	.00	0.

1	0725	90	.00	.00	.00	0.	*	1	1955	240	.00	.00	.00	0.
1	0730	91	.00	.00	.00	0.	*	1	2000	241	.00	.00	.00	0.
1	0735	92	.00	.00	.00	0.	*	1	2005	242	.00	.00	.00	0.
1	0740	93	.00	.00	.00	0.	*	1	2010	243	.00	.00	.00	0.
1	0745	94	.00	.00	.00	0.	*	1	2015	244	.00	.00	.00	0.
1	0750	95	.00	.00	.00	0.	*	1	2020	245	.00	.00	.00	0.
1	0755	96	.00	.00	.00	0.	*	1	2025	246	.00	.00	.00	0.
1	0800	97	.00	.00	.00	0.	*	1	2030	247	.00	.00	.00	0.
1	0805	98	.00	.00	.00	0.	*	1	2035	248	.00	.00	.00	0.
1	0810	99	.00	.00	.00	0.	*	1	2040	249	.00	.00	.00	0.
1	0815	100	.00	.00	.00	0.	*	1	2045	250	.00	.00	.00	0.
1	0820	101	.00	.00	.00	0.	*	1	2050	251	.00	.00	.00	0.
1	0825	102	.00	.00	.00	0.	*	1	2055	252	.00	.00	.00	0.
1	0830	103	.00	.00	.00	0.	*	1	2100	253	.00	.00	.00	0.
1	0835	104	.00	.00	.00	0.	*	1	2105	254	.00	.00	.00	0.
1	0840	105	.00	.00	.00	0.	*	1	2110	255	.00	.00	.00	0.
1	0845	106	.00	.00	.00	0.	*	1	2115	256	.00	.00	.00	0.
1	0850	107	.00	.00	.00	0.	*	1	2120	257	.00	.00	.00	0.
1	0855	108	.00	.00	.00	0.	*	1	2125	258	.00	.00	.00	0.
1	0900	109	.00	.00	.00	0.	*	1	2130	259	.00	.00	.00	0.
1	0905	110	.00	.00	.00	0.	*	1	2135	260	.00	.00	.00	0.
1	0910	111	.00	.00	.00	0.	*	1	2140	261	.00	.00	.00	0.
1	0915	112	.00	.00	.00	0.	*	1	2145	262	.00	.00	.00	0.
1	0920	113	.00	.00	.00	0.	*	1	2150	263	.00	.00	.00	0.
1	0925	114	.00	.00	.00	0.	*	1	2155	264	.00	.00	.00	0.
1	0930	115	.00	.00	.00	0.	*	1	2200	265	.00	.00	.00	0.
1	0935	116	.00	.00	.00	0.	*	1	2205	266	.00	.00	.00	0.
1	0940	117	.00	.00	.00	0.	*	1	2210	267	.00	.00	.00	0.
1	0945	118	.00	.00	.00	0.	*	1	2215	268	.00	.00	.00	0.
1	0950	119	.00	.00	.00	0.	*	1	2220	269	.00	.00	.00	0.
1	0955	120	.00	.00	.00	0.	*	1	2225	270	.00	.00	.00	0.
1	1000	121	.00	.00	.00	0.	*	1	2230	271	.00	.00	.00	0.
1	1005	122	.00	.00	.00	0.	*	1	2235	272	.00	.00	.00	0.
1	1010	123	.00	.00	.00	0.	*	1	2240	273	.00	.00	.00	0.
1	1015	124	.00	.00	.00	0.	*	1	2245	274	.00	.00	.00	0.
1	1020	125	.00	.00	.00	0.	*	1	2250	275	.00	.00	.00	0.
1	1025	126	.00	.00	.00	0.	*	1	2255	276	.00	.00	.00	0.
1	1030	127	.00	.00	.00	0.	*	1	2300	277	.00	.00	.00	0.
1	1035	128	.00	.00	.00	0.	*	1	2305	278	.00	.00	.00	0.
1	1040	129	.00	.00	.00	0.	*	1	2310	279	.00	.00	.00	0.
1	1045	130	.00	.00	.00	0.	*	1	2315	280	.00	.00	.00	0.
1	1050	131	.00	.00	.00	0.	*	1	2320	281	.00	.00	.00	0.
1	1055	132	.00	.00	.00	0.	*	1	2325	282	.00	.00	.00	0.
1	1100	133	.00	.00	.00	0.	*	1	2330	283	.00	.00	.00	0.
1	1105	134	.00	.00	.00	0.	*	1	2335	284	.00	.00	.00	0.
1	1110	135	.00	.00	.00	0.	*	1	2340	285	.00	.00	.00	0.
1	1115	136	.00	.00	.00	0.	*	1	2345	286	.00	.00	.00	0.
1	1120	137	.00	.00	.00	0.	*	1	2350	287	.00	.00	.00	0.
1	1125	138	.00	.00	.00	0.	*	1	2355	288	.00	.00	.00	0.
1	1130	139	.00	.00	.00	0.	*	2	0000	289	.00	.00	.00	0.
1	1135	140	.00	.00	.00	0.	*	2	0005	290	.00	.00	.00	0.
1	1140	141	.00	.00	.00	0.	*	2	0010	291	.00	.00	.00	0.
1	1145	142	.00	.00	.00	0.	*	2	0015	292	.00	.00	.00	0.
1	1150	143	.00	.00	.00	0.	*	2	0020	293	.00	.00	.00	0.
1	1155	144	.00	.00	.00	0.	*	2	0025	294	.00	.00	.00	0.
1	1200	145	.00	.00	.00	0.	*	2	0030	295	.00	.00	.00	0.
1	1205	146	.00	.00	.00	0.	*	2	0035	296	.00	.00	.00	0.
1	1210	147	.00	.00	.00	0.	*	2	0040	297	.00	.00	.00	0.
1	1215	148	.00	.00	.00	0.	*	2	0045	298	.00	.00	.00	0.
1	1220	149	.00	.00	.00	0.	*	2	0050	299	.00	.00	.00	0.
1	1225	150	.00	.00	.00	0.	*	2	0055	300	.00	.00	.00	0.

TOTAL RAINFALL = 3.43, TOTAL LOSS = 1.84, TOTAL EXCESS = 1.59

PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW			
		6-HR	24-HR	72-HR	24.92-HR
(CFS)	(HR)	(CFS)			
729.	3.58	92.	23.	22.	22.
	(INCHES)	1.588	1.588	1.588	1.588
	(AC-FT)	46.	46.	46.	46.

CUMULATIVE AREA = .54 SQ MI

WARNING *** TIME INTERVAL IS GREATER THAN .29*LAG

HYDROGRAPH AT STATION 2
PLAN 1, RATIO = .90

DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q		DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q
1		0000	1	.00	.00	.00	0.	*	1		1230	151	.00	.00	.00	0.
1		0005	2	.06	.06	.00	0.	*	1		1235	152	.00	.00	.00	0.
1		0010	3	.11	.11	.00	0.	*	1		1240	153	.00	.00	.00	0.
1		0015	4	.04	.04	.00	0.	*	1		1245	154	.00	.00	.00	0.
1		0020	5	.05	.05	.00	0.	*	1		1250	155	.00	.00	.00	0.

1	0025	6	.06	.06	.00	0.	*	1	1255	156	.00	.00	.00	0.
1	0030	7	.05	.05	.00	0.	*	1	1300	157	.00	.00	.00	0.
1	0035	8	.02	.02	.00	0.	*	1	1305	158	.00	.00	.00	0.
1	0040	9	.00	.00	.00	0.	*	1	1310	159	.00	.00	.00	0.
1	0045	10	.00	.00	.00	0.	*	1	1315	160	.00	.00	.00	0.
1	0050	11	.00	.00	.00	0.	*	1	1320	161	.00	.00	.00	0.
1	0055	12	.00	.00	.00	0.	*	1	1325	162	.00	.00	.00	0.
1	0100	13	.00	.00	.00	0.	*	1	1330	163	.00	.00	.00	0.
1	0105	14	.01	.01	.00	0.	*	1	1335	164	.00	.00	.00	0.
1	0110	15	.02	.02	.00	0.	*	1	1340	165	.00	.00	.00	0.
1	0115	16	.01	.01	.00	0.	*	1	1345	166	.00	.00	.00	0.
1	0120	17	.02	.02	.00	0.	*	1	1350	167	.00	.00	.00	0.
1	0125	18	.03	.03	.00	0.	*	1	1355	168	.00	.00	.00	0.
1	0130	19	.04	.04	.00	0.	*	1	1400	169	.00	.00	.00	0.
1	0135	20	.03	.03	.00	1.	*	1	1405	170	.00	.00	.00	0.
1	0140	21	.03	.03	.00	3.	*	1	1410	171	.00	.00	.00	0.
1	0145	22	.02	.02	.00	4.	*	1	1415	172	.00	.00	.00	0.
1	0150	23	.01	.01	.00	5.	*	1	1420	173	.00	.00	.00	0.
1	0155	24	.00	.00	.00	4.	*	1	1425	174	.00	.00	.00	0.
1	0200	25	.00	.00	.00	3.	*	1	1430	175	.00	.00	.00	0.
1	0205	26	.01	.01	.00	2.	*	1	1435	176	.00	.00	.00	0.
1	0210	27	.03	.03	.00	4.	*	1	1440	177	.00	.00	.00	0.
1	0215	28	.05	.04	.01	9.	*	1	1445	178	.00	.00	.00	0.
1	0220	29	.04	.03	.01	16.	*	1	1450	179	.00	.00	.00	0.
1	0225	30	.02	.02	.00	20.	*	1	1455	180	.00	.00	.00	0.
1	0230	31	.01	.01	.00	18.	*	1	1500	181	.00	.00	.00	0.
1	0235	32	.02	.01	.00	15.	*	1	1505	182	.00	.00	.00	0.
1	0240	33	.04	.03	.01	15.	*	1	1510	183	.00	.00	.00	0.
1	0245	34	.02	.02	.01	22.	*	1	1515	184	.00	.00	.00	0.
1	0250	35	.01	.01	.00	23.	*	1	1520	185	.00	.00	.00	0.
1	0255	36	.01	.00	.00	18.	*	1	1525	186	.00	.00	.00	0.
1	0300	37	.04	.03	.01	16.	*	1	1530	187	.00	.00	.00	0.
1	0305	38	.08	.06	.02	30.	*	1	1535	188	.00	.00	.00	0.
1	0310	39	.09	.06	.03	59.	*	1	1540	189	.00	.00	.00	0.
1	0315	40	.18	.11	.07	105.	*	1	1545	190	.00	.00	.00	0.
1	0320	41	.28	.15	.13	199.	*	1	1550	191	.00	.00	.00	0.
1	0325	42	.28	.13	.15	341.	*	1	1555	192	.00	.00	.00	0.
1	0330	43	.37	.14	.23	506.	*	1	1600	193	.00	.00	.00	0.
1	0335	44	.10	.04	.07	609.	*	1	1605	194	.00	.00	.00	0.
1	0340	45	.11	.04	.08	542.	*	1	1610	195	.00	.00	.00	0.
1	0345	46	.10	.03	.07	429.	*	1	1615	196	.00	.00	.00	0.
1	0350	47	.02	.01	.02	336.	*	1	1620	197	.00	.00	.00	0.
1	0355	48	.05	.01	.03	239.	*	1	1625	198	.00	.00	.00	0.
1	0400	49	.05	.01	.03	183.	*	1	1630	199	.00	.00	.00	0.
1	0405	50	.02	.00	.01	153.	*	1	1635	200	.00	.00	.00	0.
1	0410	51	.01	.00	.01	112.	*	1	1640	201	.00	.00	.00	0.
1	0415	52	.02	.01	.02	81.	*	1	1645	202	.00	.00	.00	0.
1	0420	53	.02	.01	.02	72.	*	1	1650	203	.00	.00	.00	0.
1	0425	54	.04	.01	.03	76.	*	1	1655	204	.00	.00	.00	0.
1	0430	55	.07	.02	.05	99.	*	1	1700	205	.00	.00	.00	0.
1	0435	56	.05	.01	.04	133.	*	1	1705	206	.00	.00	.00	0.
1	0440	57	.03	.01	.03	144.	*	1	1710	207	.00	.00	.00	0.
1	0445	58	.04	.01	.03	134.	*	1	1715	208	.00	.00	.00	0.
1	0450	59	.06	.02	.05	134.	*	1	1720	209	.00	.00	.00	0.
1	0455	60	.02	.00	.01	139.	*	1	1725	210	.00	.00	.00	0.
1	0500	61	.02	.00	.01	117.	*	1	1730	211	.00	.00	.00	0.
1	0505	62	.01	.00	.01	86.	*	1	1735	212	.00	.00	.00	0.
1	0510	63	.01	.00	.00	61.	*	1	1740	213	.00	.00	.00	0.
1	0515	64	.01	.00	.00	42.	*	1	1745	214	.00	.00	.00	0.
1	0520	65	.00	.00	.00	30.	*	1	1750	215	.00	.00	.00	0.
1	0525	66	.01	.00	.01	23.	*	1	1755	216	.00	.00	.00	0.
1	0530	67	.00	.00	.00	20.	*	1	1800	217	.00	.00	.00	0.
1	0535	68	.00	.00	.00	15.	*	1	1805	218	.00	.00	.00	0.
1	0540	69	.00	.00	.00	11.	*	1	1810	219	.00	.00	.00	0.
1	0545	70	.01	.00	.01	13.	*	1	1815	220	.00	.00	.00	0.
1	0550	71	.00	.00	.00	15.	*	1	1820	221	.00	.00	.00	0.
1	0555	72	.00	.00	.00	12.	*	1	1825	222	.00	.00	.00	0.
1	0600	73	.00	.00	.00	10.	*	1	1830	223	.00	.00	.00	0.
1	0605	74	.00	.00	.00	9.	*	1	1835	224	.00	.00	.00	0.
1	0610	75	.00	.00	.00	6.	*	1	1840	225	.00	.00	.00	0.
1	0615	76	.00	.00	.00	3.	*	1	1845	226	.00	.00	.00	0.
1	0620	77	.00	.00	.00	1.	*	1	1850	227	.00	.00	.00	0.
1	0625	78	.00	.00	.00	1.	*	1	1855	228	.00	.00	.00	0.
1	0630	79	.00	.00	.00	0.	*	1	1900	229	.00	.00	.00	0.
1	0635	80	.00	.00	.00	0.	*	1	1905	230	.00	.00	.00	0.
1	0640	81	.00	.00	.00	0.	*	1	1910	231	.00	.00	.00	0.
1	0645	82	.00	.00	.00	0.	*	1	1915	232	.00	.00	.00	0.
1	0650	83	.00	.00	.00	0.	*	1	1920	233	.00	.00	.00	0.
1	0655	84	.00	.00	.00	0.	*	1	1925	234	.00	.00	.00	0.
1	0700	85	.00	.00	.00	0.	*	1	1930	235	.00	.00	.00	0.
1	0705	86	.00	.00	.00	0.	*	1	1935	236	.00	.00	.00	0.
1	0710	87	.00	.00	.00	0.	*	1	1940	237	.00	.00	.00	0.
1	0715	88	.00	.00	.00	0.	*	1	1945	238	.00	.00	.00	0.
1	0720	89	.00	.00	.00	0.	*	1	1950	239	.00	.00	.00	0.
1	0725	90	.00	.00	.00	0.	*	1	1955	240	.00	.00	.00	0.
1	0730	91	.00	.00	.00	0.	*	1	2000	241	.00	.00	.00	0.
1	0735	92	.00	.00	.00	0.	*	1	2005	242	.00	.00	.00	0.
1	0740	93	.00	.00	.00	0.	*	1	2010	243	.00	.00	.00	0.
1	0745	94	.00	.00	.00	0.	*	1	2015	244	.00	.00	.00	0.
1	0750	95	.00	.00	.00	0.	*	1	2020	245	.00	.00	.00	0.
1	0755	96	.00	.00	.00	0.	*	1	2025	246	.00	.00	.00	0.
1	0800	97	.00	.00	.00	0.	*	1	2030	247	.00	.00	.00	0.
1	0805	98	.00	.00	.00	0.	*	1	2035	248	.00	.00	.00	0.
1	0810	99	.00	.00	.00	0.	*	1	2040	249	.00	.00	.00	0.
1	0815	100	.00	.00	.00	0.	*	1	2045	250	.00	.00	.00	0.
1	0820	101	.00	.00	.00	0.	*	1	2050	251	.00	.00	.00	0.
1	0825	102	.00	.00	.00	0.	*	1	2055	252	.00	.00	.00	0.
1	0830	103	.00	.00	.00	0.	*	1	2100	253	.00	.00	.00	0.
1	0835	104	.00	.00	.00	0.	*	1	2105	254	.00	.00	.00	0.

1	0840	105	.00	.00	.00	0.	*	1	2110	255	.00	.00	.00	0.
1	0845	106	.00	.00	.00	0.	*	1	2115	256	.00	.00	.00	0.
1	0850	107	.00	.00	.00	0.	*	1	2120	257	.00	.00	.00	0.
1	0855	108	.00	.00	.00	0.	*	1	2125	258	.00	.00	.00	0.
1	0900	109	.00	.00	.00	0.	*	1	2130	259	.00	.00	.00	0.
1	0905	110	.00	.00	.00	0.	*	1	2135	260	.00	.00	.00	0.
1	0910	111	.00	.00	.00	0.	*	1	2140	261	.00	.00	.00	0.
1	0915	112	.00	.00	.00	0.	*	1	2145	262	.00	.00	.00	0.
1	0920	113	.00	.00	.00	0.	*	1	2150	263	.00	.00	.00	0.
1	0925	114	.00	.00	.00	0.	*	1	2155	264	.00	.00	.00	0.
1	0930	115	.00	.00	.00	0.	*	1	2200	265	.00	.00	.00	0.
1	0935	116	.00	.00	.00	0.	*	1	2205	266	.00	.00	.00	0.
1	0940	117	.00	.00	.00	0.	*	1	2210	267	.00	.00	.00	0.
1	0945	118	.00	.00	.00	0.	*	1	2215	268	.00	.00	.00	0.
1	0950	119	.00	.00	.00	0.	*	1	2220	269	.00	.00	.00	0.
1	0955	120	.00	.00	.00	0.	*	1	2225	270	.00	.00	.00	0.
1	1000	121	.00	.00	.00	0.	*	1	2230	271	.00	.00	.00	0.
1	1005	122	.00	.00	.00	0.	*	1	2235	272	.00	.00	.00	0.
1	1010	123	.00	.00	.00	0.	*	1	2240	273	.00	.00	.00	0.
1	1015	124	.00	.00	.00	0.	*	1	2245	274	.00	.00	.00	0.
1	1020	125	.00	.00	.00	0.	*	1	2250	275	.00	.00	.00	0.
1	1025	126	.00	.00	.00	0.	*	1	2255	276	.00	.00	.00	0.
1	1030	127	.00	.00	.00	0.	*	1	2300	277	.00	.00	.00	0.
1	1035	128	.00	.00	.00	0.	*	1	2305	278	.00	.00	.00	0.
1	1040	129	.00	.00	.00	0.	*	1	2310	279	.00	.00	.00	0.
1	1045	130	.00	.00	.00	0.	*	1	2315	280	.00	.00	.00	0.
1	1050	131	.00	.00	.00	0.	*	1	2320	281	.00	.00	.00	0.
1	1055	132	.00	.00	.00	0.	*	1	2325	282	.00	.00	.00	0.
1	1100	133	.00	.00	.00	0.	*	1	2330	283	.00	.00	.00	0.
1	1105	134	.00	.00	.00	0.	*	1	2335	284	.00	.00	.00	0.
1	1110	135	.00	.00	.00	0.	*	1	2340	285	.00	.00	.00	0.
1	1115	136	.00	.00	.00	0.	*	1	2345	286	.00	.00	.00	0.
1	1120	137	.00	.00	.00	0.	*	1	2350	287	.00	.00	.00	0.
1	1125	138	.00	.00	.00	0.	*	1	2355	288	.00	.00	.00	0.
1	1130	139	.00	.00	.00	0.	*	2	0000	289	.00	.00	.00	0.
1	1135	140	.00	.00	.00	0.	*	2	0005	290	.00	.00	.00	0.
1	1140	141	.00	.00	.00	0.	*	2	0010	291	.00	.00	.00	0.
1	1145	142	.00	.00	.00	0.	*	2	0015	292	.00	.00	.00	0.
1	1150	143	.00	.00	.00	0.	*	2	0020	293	.00	.00	.00	0.
1	1155	144	.00	.00	.00	0.	*	2	0025	294	.00	.00	.00	0.
1	1200	145	.00	.00	.00	0.	*	2	0030	295	.00	.00	.00	0.
1	1205	146	.00	.00	.00	0.	*	2	0035	296	.00	.00	.00	0.
1	1210	147	.00	.00	.00	0.	*	2	0040	297	.00	.00	.00	0.
1	1215	148	.00	.00	.00	0.	*	2	0045	298	.00	.00	.00	0.
1	1220	149	.00	.00	.00	0.	*	2	0050	299	.00	.00	.00	0.
1	1225	150	.00	.00	.00	0.	*	2	0055	300	.00	.00	.00	0.
							*							

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*

TOTAL RAINFALL = 3.09, TOTAL LOSS = 1.76, TOTAL EXCESS = 1.32

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.92-HR
+ (CFS)	(HR)					
		(CFS)				
+ 609.	3.58		77.	19.	18.	18.
		(INCHES)	1.322	1.322	1.322	1.322
		(AC-FT)	38.	38.	38.	38.

CUMULATIVE AREA = .54 SQ MI

*** *** *** *

40 UD SCS DIMENSIONLESS UNITGRAPH
TLAG .15 LAG

***

WARNING *** TIME INTERVAL IS GREATER THAN .29*LAG

UNIT HYDROGRAPH
11 END-OF-PERIOD ORDINATES
330. 859. 736. 362. 179. 87. 42. 21. 10. 5.
1.

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HYDROGRAPH AT STATION 3

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DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q	DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q
1		0000	1	.00	.00	.00	0.	1		1230	151	.00	.00	.00	0.
1		0005	2	.07	.07	.00	0.	1		1235	152	.00	.00	.00	0.
1		0010	3	.13	.13	.00	0.	1		1240	153	.00	.00	.00	0.
1		0015	4	.04	.04	.00	0.	1		1245	154	.00	.00	.00	0.
1		0020	5	.06	.06	.00	0.	1		1250	155	.00	.00	.00	0.
1		0025	6	.07	.07	.00	0.	1		1255	156	.00	.00	.00	0.
1		0030	7	.05	.05	.00	0.	1		1300	157	.00	.00	.00	0.
1		0035	8	.02	.02	.00	0.	1		1305	158	.00	.00	.00	0.
1		0040	9	.00	.00	.00	0.	1		1310	159	.00	.00	.00	0.
1		0045	10	.00	.00	.00	0.	1		1315	160	.00	.00	.00	0.
1		0050	11	.00	.00	.00	0.	1		1320	161	.00	.00	.00	0.
1		0055	12	.00	.00	.00	0.	1		1325	162	.00	.00	.00	0.
1		0100	13	.00	.00	.00	0.	1		1330	163	.00	.00	.00	0.
1		0105	14	.01	.01	.00	0.	1		1335	164	.00	.00	.00	0.
1		0110	15	.02	.02	.00	1.	1		1340	165	.00	.00	.00	0.
1		0115	16	.01	.01	.00	1.	1		1345	166	.00	.00	.00	0.
1		0120	17	.02	.02	.00	2.	1		1350	167	.00	.00	.00	0.
1		0125	18	.03	.03	.00	3.	1		1355	168	.00	.00	.00	0.
1		0130	19	.05	.04	.01	6.	1		1400	169	.00	.00	.00	0.
1		0135	20	.03	.03	.00	10.	1		1405	170	.00	.00	.00	0.
1		0140	21	.03	.03	.01	12.	1		1410	171	.00	.00	.00	0.
1		0145	22	.02	.02	.00	13.	1		1415	172	.00	.00	.00	0.
1		0150	23	.01	.01	.00	12.	1		1420	173	.00	.00	.00	0.
1		0155	24	.00	.00	.00	9.	1		1425	174	.00	.00	.00	0.
1		0200	25	.00	.00	.00	5.	1		1430	175	.00	.00	.00	0.
1		0205	26	.01	.01	.00	4.	1		1435	176	.00	.00	.00	0.
1		0210	27	.03	.03	.01	6.	1		1440	177	.00	.00	.00	0.
1		0215	28	.05	.04	.01	14.	1		1445	178	.00	.00	.00	0.
1		0220	29	.04	.03	.01	23.	1		1450	179	.00	.00	.00	0.
1		0225	30	.03	.02	.01	26.	1		1455	180	.00	.00	.00	0.
1		0230	31	.01	.00	.00	23.	1		1500	181	.00	.00	.00	0.
1		0235	32	.02	.01	.01	17.	1		1505	182	.00	.00	.00	0.
1		0240	33	.05	.03	.02	19.	1		1510	183	.00	.00	.00	0.
1		0245	34	.03	.02	.01	25.	1		1515	184	.00	.00	.00	0.
1		0250	35	.01	.01	.00	26.	1		1520	185	.00	.00	.00	0.
1		0255	36	.01	.00	.00	19.	1		1525	186	.00	.00	.00	0.
1		0300	37	.04	.03	.02	18.	1		1530	187	.00	.00	.00	0.
1		0305	38	.09	.05	.04	33.	1		1535	188	.00	.00	.00	0.
1		0310	39	.10	.06	.05	63.	1		1540	189	.00	.00	.00	0.
1		0315	40	.20	.10	.10	108.	1		1545	190	.00	.00	.00	0.
1		0320	41	.31	.13	.18	196.	1		1550	191	.00	.00	.00	0.
1		0325	42	.31	.11	.20	319.	1		1555	192	.00	.00	.00	0.
1		0330	43	.41	.12	.29	451.	1		1600	193	.00	.00	.00	0.
1		0335	44	.12	.03	.09	518.	1		1605	194	.00	.00	.00	0.
1		0340	45	.13	.03	.10	440.	1		1610	195	.00	.00	.00	0.
1		0345	46	.11	.02	.08	338.	1		1615	196	.00	.00	.00	0.
1		0350	47	.02	.01	.02	260.	1		1620	197	.00	.00	.00	0.
1		0355	48	.05	.01	.04	181.	1		1625	198	.00	.00	.00	0.
1		0400	49	.05	.01	.04	139.	1		1630	199	.00	.00	.00	0.
1		0405	50	.02	.00	.01	116.	1		1635	200	.00	.00	.00	0.
1		0410	51	.01	.00	.01	83.	1		1640	201	.00	.00	.00	0.
1		0415	52	.03	.01	.02	60.	1		1645	202	.00	.00	.00	0.
1		0420	53	.03	.01	.02	55.	1		1650	203	.00	.00	.00	0.
1		0425	54	.04	.01	.03	60.	1		1655	204	.00	.00	.00	0.
1		0430	55	.08	.01	.06	79.	1		1700	205	.00	.00	.00	0.
1		0435	56	.05	.01	.04	106.	1		1705	206	.00	.00	.00	0.
1		0440	57	.04	.01	.03	112.	1		1710	207	.00	.00	.00	0.
1		0445	58	.04	.01	.04	103.	1		1715	208	.00	.00	.00	0.
1		0450	59	.07	.01	.06	104.	1		1720	209	.00	.00	.00	0.
1		0455	60	.02	.00	.02	108.	1		1725	210	.00	.00	.00	0.
1		0500	61	.02	.00	.02	88.	1		1730	211	.00	.00	.00	0.
1		0505	62	.01	.00	.01	63.	1		1735	212	.00	.00	.00	0.
1		0510	63	.01	.00	.01	44.	1		1740	213	.00	.00	.00	0.
1		0515	64	.01	.00	.01	30.	1		1745	214	.00	.00	.00	0.
1		0520	65	.00	.00	.00	21.	1		1750	215	.00	.00	.00	0.
1		0525	66	.01	.00	.01	17.	1		1755	216	.00	.00	.00	0.
1		0530	67	.00	.00	.00	15.	1		1800	217	.00	.00	.00	0.
1		0535	68	.00	.00	.00	11.	1		1805	218	.00	.00	.00	0.
1		0540	69	.00	.00	.00	8.	1		1810	219	.00	.00	.00	0.
1		0545	70	.01	.00	.01	10.	1		1815	220	.00	.00	.00	0.
1		0550	71	.00	.00	.00	12.	1		1820	221	.00	.00	.00	0.
1		0555	72	.00	.00	.00	9.	1		1825	222	.00	.00	.00	0.
1		0600	73	.00	.00	.00	7.	1		1830	223	.00	.00	.00	0.
1		0605	74	.00	.00	.00	7.	1		1835	224	.00	.00	.00	0.

1	0610	75	.00	.00	.00	4.	*	1	1840	225	.00	.00	.00	0.
1	0615	76	.00	.00	.00	2.	*	1	1845	226	.00	.00	.00	0.
1	0620	77	.00	.00	.00	1.	*	1	1850	227	.00	.00	.00	0.
1	0625	78	.00	.00	.00	0.	*	1	1855	228	.00	.00	.00	0.
1	0630	79	.00	.00	.00	0.	*	1	1900	229	.00	.00	.00	0.
1	0635	80	.00	.00	.00	0.	*	1	1905	230	.00	.00	.00	0.
1	0640	81	.00	.00	.00	0.	*	1	1910	231	.00	.00	.00	0.
1	0645	82	.00	.00	.00	0.	*	1	1915	232	.00	.00	.00	0.
1	0650	83	.00	.00	.00	0.	*	1	1920	233	.00	.00	.00	0.
1	0655	84	.00	.00	.00	0.	*	1	1925	234	.00	.00	.00	0.
1	0700	85	.00	.00	.00	0.	*	1	1930	235	.00	.00	.00	0.
1	0705	86	.00	.00	.00	0.	*	1	1935	236	.00	.00	.00	0.
1	0710	87	.00	.00	.00	0.	*	1	1940	237	.00	.00	.00	0.
1	0715	88	.00	.00	.00	0.	*	1	1945	238	.00	.00	.00	0.
1	0720	89	.00	.00	.00	0.	*	1	1950	239	.00	.00	.00	0.
1	0725	90	.00	.00	.00	0.	*	1	1955	240	.00	.00	.00	0.
1	0730	91	.00	.00	.00	0.	*	1	2000	241	.00	.00	.00	0.
1	0735	92	.00	.00	.00	0.	*	1	2005	242	.00	.00	.00	0.
1	0740	93	.00	.00	.00	0.	*	1	2010	243	.00	.00	.00	0.
1	0745	94	.00	.00	.00	0.	*	1	2015	244	.00	.00	.00	0.
1	0750	95	.00	.00	.00	0.	*	1	2020	245	.00	.00	.00	0.
1	0755	96	.00	.00	.00	0.	*	1	2025	246	.00	.00	.00	0.
1	0800	97	.00	.00	.00	0.	*	1	2030	247	.00	.00	.00	0.
1	0805	98	.00	.00	.00	0.	*	1	2035	248	.00	.00	.00	0.
1	0810	99	.00	.00	.00	0.	*	1	2040	249	.00	.00	.00	0.
1	0815	100	.00	.00	.00	0.	*	1	2045	250	.00	.00	.00	0.
1	0820	101	.00	.00	.00	0.	*	1	2050	251	.00	.00	.00	0.
1	0825	102	.00	.00	.00	0.	*	1	2055	252	.00	.00	.00	0.
1	0830	103	.00	.00	.00	0.	*	1	2100	253	.00	.00	.00	0.
1	0835	104	.00	.00	.00	0.	*	1	2105	254	.00	.00	.00	0.
1	0840	105	.00	.00	.00	0.	*	1	2110	255	.00	.00	.00	0.
1	0845	106	.00	.00	.00	0.	*	1	2115	256	.00	.00	.00	0.
1	0850	107	.00	.00	.00	0.	*	1	2120	257	.00	.00	.00	0.
1	0855	108	.00	.00	.00	0.	*	1	2125	258	.00	.00	.00	0.
1	0900	109	.00	.00	.00	0.	*	1	2130	259	.00	.00	.00	0.
1	0905	110	.00	.00	.00	0.	*	1	2135	260	.00	.00	.00	0.
1	0910	111	.00	.00	.00	0.	*	1	2140	261	.00	.00	.00	0.
1	0915	112	.00	.00	.00	0.	*	1	2145	262	.00	.00	.00	0.
1	0920	113	.00	.00	.00	0.	*	1	2150	263	.00	.00	.00	0.
1	0925	114	.00	.00	.00	0.	*	1	2155	264	.00	.00	.00	0.
1	0930	115	.00	.00	.00	0.	*	1	2200	265	.00	.00	.00	0.
1	0935	116	.00	.00	.00	0.	*	1	2205	266	.00	.00	.00	0.
1	0940	117	.00	.00	.00	0.	*	1	2210	267	.00	.00	.00	0.
1	0945	118	.00	.00	.00	0.	*	1	2215	268	.00	.00	.00	0.
1	0950	119	.00	.00	.00	0.	*	1	2220	269	.00	.00	.00	0.
1	0955	120	.00	.00	.00	0.	*	1	2225	270	.00	.00	.00	0.
1	1000	121	.00	.00	.00	0.	*	1	2230	271	.00	.00	.00	0.
1	1005	122	.00	.00	.00	0.	*	1	2235	272	.00	.00	.00	0.
1	1010	123	.00	.00	.00	0.	*	1	2240	273	.00	.00	.00	0.
1	1015	124	.00	.00	.00	0.	*	1	2245	274	.00	.00	.00	0.
1	1020	125	.00	.00	.00	0.	*	1	2250	275	.00	.00	.00	0.
1	1025	126	.00	.00	.00	0.	*	1	2255	276	.00	.00	.00	0.
1	1030	127	.00	.00	.00	0.	*	1	2300	277	.00	.00	.00	0.
1	1035	128	.00	.00	.00	0.	*	1	2305	278	.00	.00	.00	0.
1	1040	129	.00	.00	.00	0.	*	1	2310	279	.00	.00	.00	0.
1	1045	130	.00	.00	.00	0.	*	1	2315	280	.00	.00	.00	0.
1	1050	131	.00	.00	.00	0.	*	1	2320	281	.00	.00	.00	0.
1	1055	132	.00	.00	.00	0.	*	1	2325	282	.00	.00	.00	0.
1	1100	133	.00	.00	.00	0.	*	1	2330	283	.00	.00	.00	0.
1	1105	134	.00	.00	.00	0.	*	1	2335	284	.00	.00	.00	0.
1	1110	135	.00	.00	.00	0.	*	1	2340	285	.00	.00	.00	0.
1	1115	136	.00	.00	.00	0.	*	1	2345	286	.00	.00	.00	0.
1	1120	137	.00	.00	.00	0.	*	1	2350	287	.00	.00	.00	0.
1	1125	138	.00	.00	.00	0.	*	1	2355	288	.00	.00	.00	0.
1	1130	139	.00	.00	.00	0.	*	2	0000	289	.00	.00	.00	0.
1	1135	140	.00	.00	.00	0.	*	2	0005	290	.00	.00	.00	0.
1	1140	141	.00	.00	.00	0.	*	2	0010	291	.00	.00	.00	0.
1	1145	142	.00	.00	.00	0.	*	2	0015	292	.00	.00	.00	0.
1	1150	143	.00	.00	.00	0.	*	2	0020	293	.00	.00	.00	0.
1	1155	144	.00	.00	.00	0.	*	2	0025	294	.00	.00	.00	0.
1	1200	145	.00	.00	.00	0.	*	2	0030	295	.00	.00	.00	0.
1	1205	146	.00	.00	.00	0.	*	2	0035	296	.00	.00	.00	0.
1	1210	147	.00	.00	.00	0.	*	2	0040	297	.00	.00	.00	0.
1	1215	148	.00	.00	.00	0.	*	2	0045	298	.00	.00	.00	0.
1	1220	149	.00	.00	.00	0.	*	2	0050	299	.00	.00	.00	0.
1	1225	150	.00	.00	.00	0.	*	2	0055	300	.00	.00	.00	0.
							*							

****

TOTAL RAINFALL = 3.43, TOTAL LOSS = 1.65, TOTAL EXCESS = 1.78

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.92-HR
(CFS)	(HR)					
		(CFS)				
518.	3.58		65.	16.	16.	16.
		(INCHES)	1.777	1.777	1.777	1.777
		(AC-FT)	32.	32.	32.	32.

CUMULATIVE AREA = .34 SQ MI

WARNING *** TIME INTERVAL IS GREATER THAN .29*LAG

****

HYDROGRAPH AT STATION 3
PLAN 1, RATIO = .90

DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q	DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q
1		0000	1	.00	.00	.00	0.	1		1230	151	.00	.00	.00	0.
1		0005	2	.06	.06	.00	0.	1		1235	152	.00	.00	.00	0.
1		0010	3	.11	.11	.00	0.	1		1240	153	.00	.00	.00	0.
1		0015	4	.04	.04	.00	0.	1		1245	154	.00	.00	.00	0.
1		0020	5	.05	.05	.00	0.	1		1250	155	.00	.00	.00	0.
1		0025	6	.06	.06	.00	0.	1		1255	156	.00	.00	.00	0.
1		0030	7	.05	.05	.00	0.	1		1300	157	.00	.00	.00	0.
1		0035	8	.02	.02	.00	0.	1		1305	158	.00	.00	.00	0.
1		0040	9	.00	.00	.00	0.	1		1310	159	.00	.00	.00	0.
1		0045	10	.00	.00	.00	0.	1		1315	160	.00	.00	.00	0.
1		0050	11	.00	.00	.00	0.	1		1320	161	.00	.00	.00	0.
1		0055	12	.00	.00	.00	0.	1		1325	162	.00	.00	.00	0.
1		0100	13	.00	.00	.00	0.	1		1330	163	.00	.00	.00	0.
1		0105	14	.01	.01	.00	0.	1		1335	164	.00	.00	.00	0.
1		0110	15	.02	.02	.00	0.	1		1340	165	.00	.00	.00	0.
1		0115	16	.01	.01	.00	0.	1		1345	166	.00	.00	.00	0.
1		0120	17	.02	.02	.00	0.	1		1350	167	.00	.00	.00	0.
1		0125	18	.03	.03	.00	1.	1		1355	168	.00	.00	.00	0.
1		0130	19	.04	.04	.00	3.	1		1400	169	.00	.00	.00	0.
1		0135	20	.03	.02	.00	5.	1		1405	170	.00	.00	.00	0.
1		0140	21	.03	.02	.00	7.	1		1410	171	.00	.00	.00	0.
1		0145	22	.02	.02	.00	8.	1		1415	172	.00	.00	.00	0.
1		0150	23	.01	.01	.00	8.	1		1420	173	.00	.00	.00	0.
1		0155	24	.00	.00	.00	6.	1		1425	174	.00	.00	.00	0.
1		0200	25	.00	.00	.00	4.	1		1430	175	.00	.00	.00	0.
1		0205	26	.01	.01	.00	3.	1		1435	176	.00	.00	.00	0.
1		0210	27	.03	.03	.01	5.	1		1440	177	.00	.00	.00	0.
1		0215	28	.05	.04	.01	10.	1		1445	178	.00	.00	.00	0.
1		0220	29	.04	.03	.01	16.	1		1450	179	.00	.00	.00	0.
1		0225	30	.02	.02	.01	19.	1		1455	180	.00	.00	.00	0.
1		0230	31	.01	.00	.00	17.	1		1500	181	.00	.00	.00	0.
1		0235	32	.02	.01	.00	13.	1		1505	182	.00	.00	.00	0.
1		0240	33	.04	.03	.01	14.	1		1510	183	.00	.00	.00	0.
1		0245	34	.02	.02	.01	20.	1		1515	184	.00	.00	.00	0.
1		0250	35	.01	.01	.00	20.	1		1520	185	.00	.00	.00	0.
1		0255	36	.01	.00	.00	15.	1		1525	186	.00	.00	.00	0.
1		0300	37	.04	.02	.01	14.	1		1530	187	.00	.00	.00	0.
1		0305	38	.08	.05	.03	26.	1		1535	188	.00	.00	.00	0.
1		0310	39	.09	.06	.04	50.	1		1540	189	.00	.00	.00	0.
1		0315	40	.18	.10	.08	87.	1		1545	190	.00	.00	.00	0.
1		0320	41	.28	.13	.15	160.	1		1550	191	.00	.00	.00	0.
1		0325	42	.28	.11	.17	265.	1		1555	192	.00	.00	.00	0.
1		0330	43	.37	.12	.25	379.	1		1600	193	.00	.00	.00	0.
1		0335	44	.10	.03	.08	439.	1		1605	194	.00	.00	.00	0.
1		0340	45	.11	.03	.08	375.	1		1610	195	.00	.00	.00	0.
1		0345	46	.10	.02	.07	289.	1		1615	196	.00	.00	.00	0.
1		0350	47	.02	.01	.02	223.	1		1620	197	.00	.00	.00	0.
1		0355	48	.05	.01	.04	155.	1		1625	198	.00	.00	.00	0.
1		0400	49	.05	.01	.04	120.	1		1630	199	.00	.00	.00	0.
1		0405	50	.02	.00	.01	100.	1		1635	200	.00	.00	.00	0.
1		0410	51	.01	.00	.01	72.	1		1640	201	.00	.00	.00	0.
1		0415	52	.02	.01	.02	52.	1		1645	202	.00	.00	.00	0.
1		0420	53	.02	.01	.02	47.	1		1650	203	.00	.00	.00	0.
1		0425	54	.04	.01	.03	52.	1		1655	204	.00	.00	.00	0.
1		0430	55	.07	.02	.05	69.	1		1700	205	.00	.00	.00	0.
1		0435	56	.05	.01	.04	92.	1		1705	206	.00	.00	.00	0.
1		0440	57	.03	.01	.03	98.	1		1710	207	.00	.00	.00	0.
1		0445	58	.04	.01	.03	89.	1		1715	208	.00	.00	.00	0.
1		0450	59	.06	.01	.05	91.	1		1720	209	.00	.00	.00	0.
1		0455	60	.02	.00	.01	94.	1		1725	210	.00	.00	.00	0.
1		0500	61	.02	.00	.01	77.	1		1730	211	.00	.00	.00	0.
1		0505	62	.01	.00	.01	55.	1		1735	212	.00	.00	.00	0.
1		0510	63	.01	.00	.00	39.	1		1740	213	.00	.00	.00	0.
1		0515	64	.01	.00	.00	26.	1		1745	214	.00	.00	.00	0.
1		0520	65	.00	.00	.00	19.	1		1750	215	.00	.00	.00	0.
1		0525	66	.01	.00	.01	15.	1		1755	216	.00	.00	.00	0.
1		0530	67	.00	.00	.00	13.	1		1800	217	.00	.00	.00	0.
1		0535	68	.00	.00	.00	10.	1		1805	218	.00	.00	.00	0.
1		0540	69	.00	.00	.00	7.	1		1810	219	.00	.00	.00	0.
1		0545	70	.01	.00	.01	8.	1		1815	220	.00	.00	.00	0.
1		0550	71	.00	.00	.00	10.	1		1820	221	.00	.00	.00	0.
1		0555	72	.00	.00	.00	8.	1		1825	222	.00	.00	.00	0.
1		0600	73	.00	.00	.00	7.	1		1830	223	.00	.00	.00	0.
1		0605	74	.00	.00	.00	6.	1		1835	224	.00	.00	.00	0.
1		0610	75	.00	.00	.00	4.	1		1840	225	.00	.00	.00	0.
1		0615	76	.00	.00	.00	2.	1		1845	226	.00	.00	.00	0.
1		0620	77	.00	.00	.00	1.	1		1850	227	.00	.00	.00	0.
1		0625	78	.00	.00	.00	0.	1		1855	228	.00	.00	.00	0.
1		0630	79	.00	.00	.00	0.	1		1900	229	.00	.00	.00	0.
1		0635	80	.00	.00	.00	0.	1		1905	230	.00	.00	.00	0.
1		0640	81	.00	.00	.00	0.	1		1910	231	.00	.00	.00	0.
1		0645	82	.00	.00	.00	0.	1		1915	232	.00	.00	.00	0.
1		0650	83	.00	.00	.00	0.	1		1920	233	.00	.00	.00	0.
1		0655	84	.00	.00	.00	0.	1		1925	234	.00	.00	.00	0.
1		0700	85	.00	.00	.00	0.	1		1930	235	.00	.00	.00	0.
1		0705	86	.00	.00	.00	0.	1		1935	236	.00	.00	.00	0.
1		0710	87	.00	.00	.00	0.	1		1940	237	.00	.00	.00	0.
1		0715	88	.00	.00	.00	0.	1		1945	238	.00	.00	.00	0.
1		0720	89	.00	.00	.00	0.	1		1950	239	.00	.00	.00	0.

1	0725	90	.00	.00	.00	0.	*	1	1955	240	.00	.00	.00	0.
1	0730	91	.00	.00	.00	0.	*	1	2000	241	.00	.00	.00	0.
1	0735	92	.00	.00	.00	0.	*	1	2005	242	.00	.00	.00	0.
1	0740	93	.00	.00	.00	0.	*	1	2010	243	.00	.00	.00	0.
1	0745	94	.00	.00	.00	0.	*	1	2015	244	.00	.00	.00	0.
1	0750	95	.00	.00	.00	0.	*	1	2020	245	.00	.00	.00	0.
1	0755	96	.00	.00	.00	0.	*	1	2025	246	.00	.00	.00	0.
1	0800	97	.00	.00	.00	0.	*	1	2030	247	.00	.00	.00	0.
1	0805	98	.00	.00	.00	0.	*	1	2035	248	.00	.00	.00	0.
1	0810	99	.00	.00	.00	0.	*	1	2040	249	.00	.00	.00	0.
1	0815	100	.00	.00	.00	0.	*	1	2045	250	.00	.00	.00	0.
1	0820	101	.00	.00	.00	0.	*	1	2050	251	.00	.00	.00	0.
1	0825	102	.00	.00	.00	0.	*	1	2055	252	.00	.00	.00	0.
1	0830	103	.00	.00	.00	0.	*	1	2100	253	.00	.00	.00	0.
1	0835	104	.00	.00	.00	0.	*	1	2105	254	.00	.00	.00	0.
1	0840	105	.00	.00	.00	0.	*	1	2110	255	.00	.00	.00	0.
1	0845	106	.00	.00	.00	0.	*	1	2115	256	.00	.00	.00	0.
1	0850	107	.00	.00	.00	0.	*	1	2120	257	.00	.00	.00	0.
1	0855	108	.00	.00	.00	0.	*	1	2125	258	.00	.00	.00	0.
1	0900	109	.00	.00	.00	0.	*	1	2130	259	.00	.00	.00	0.
1	0905	110	.00	.00	.00	0.	*	1	2135	260	.00	.00	.00	0.
1	0910	111	.00	.00	.00	0.	*	1	2140	261	.00	.00	.00	0.
1	0915	112	.00	.00	.00	0.	*	1	2145	262	.00	.00	.00	0.
1	0920	113	.00	.00	.00	0.	*	1	2150	263	.00	.00	.00	0.
1	0925	114	.00	.00	.00	0.	*	1	2155	264	.00	.00	.00	0.
1	0930	115	.00	.00	.00	0.	*	1	2200	265	.00	.00	.00	0.
1	0935	116	.00	.00	.00	0.	*	1	2205	266	.00	.00	.00	0.
1	0940	117	.00	.00	.00	0.	*	1	2210	267	.00	.00	.00	0.
1	0945	118	.00	.00	.00	0.	*	1	2215	268	.00	.00	.00	0.
1	0950	119	.00	.00	.00	0.	*	1	2220	269	.00	.00	.00	0.
1	0955	120	.00	.00	.00	0.	*	1	2225	270	.00	.00	.00	0.
1	1000	121	.00	.00	.00	0.	*	1	2230	271	.00	.00	.00	0.
1	1005	122	.00	.00	.00	0.	*	1	2235	272	.00	.00	.00	0.
1	1010	123	.00	.00	.00	0.	*	1	2240	273	.00	.00	.00	0.
1	1015	124	.00	.00	.00	0.	*	1	2245	274	.00	.00	.00	0.
1	1020	125	.00	.00	.00	0.	*	1	2250	275	.00	.00	.00	0.
1	1025	126	.00	.00	.00	0.	*	1	2255	276	.00	.00	.00	0.
1	1030	127	.00	.00	.00	0.	*	1	2300	277	.00	.00	.00	0.
1	1035	128	.00	.00	.00	0.	*	1	2305	278	.00	.00	.00	0.
1	1040	129	.00	.00	.00	0.	*	1	2310	279	.00	.00	.00	0.
1	1045	130	.00	.00	.00	0.	*	1	2315	280	.00	.00	.00	0.
1	1050	131	.00	.00	.00	0.	*	1	2320	281	.00	.00	.00	0.
1	1055	132	.00	.00	.00	0.	*	1	2325	282	.00	.00	.00	0.
1	1100	133	.00	.00	.00	0.	*	1	2330	283	.00	.00	.00	0.
1	1105	134	.00	.00	.00	0.	*	1	2335	284	.00	.00	.00	0.
1	1110	135	.00	.00	.00	0.	*	1	2340	285	.00	.00	.00	0.
1	1115	136	.00	.00	.00	0.	*	1	2345	286	.00	.00	.00	0.
1	1120	137	.00	.00	.00	0.	*	1	2350	287	.00	.00	.00	0.
1	1125	138	.00	.00	.00	0.	*	1	2355	288	.00	.00	.00	0.
1	1130	139	.00	.00	.00	0.	*	2	0000	289	.00	.00	.00	0.
1	1135	140	.00	.00	.00	0.	*	2	0005	290	.00	.00	.00	0.
1	1140	141	.00	.00	.00	0.	*	2	0010	291	.00	.00	.00	0.
1	1145	142	.00	.00	.00	0.	*	2	0015	292	.00	.00	.00	0.
1	1150	143	.00	.00	.00	0.	*	2	0020	293	.00	.00	.00	0.
1	1155	144	.00	.00	.00	0.	*	2	0025	294	.00	.00	.00	0.
1	1200	145	.00	.00	.00	0.	*	2	0030	295	.00	.00	.00	0.
1	1205	146	.00	.00	.00	0.	*	2	0035	296	.00	.00	.00	0.
1	1210	147	.00	.00	.00	0.	*	2	0040	297	.00	.00	.00	0.
1	1215	148	.00	.00	.00	0.	*	2	0045	298	.00	.00	.00	0.
1	1220	149	.00	.00	.00	0.	*	2	0050	299	.00	.00	.00	0.
1	1225	150	.00	.00	.00	0.	*	2	0055	300	.00	.00	.00	0.
							*							

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TOTAL RAINFALL = 3.09, TOTAL LOSS = 1.59, TOTAL EXCESS = 1.50

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.92-HR
(CFS)	(HR)	(CFS)				
439.	3.58		55.	14.	13.	13.
		(INCHES)	1.496	1.496	1.496	1.496
		(AC-FT)	27.	27.	27.	27.

CUMULATIVE AREA = .34 SQ MI

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          **************
          *            *
41 KK     *          4 *
          *            *
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SUBBASIN RUNOFF DATA

42 BA SUBBASIN CHARACTERISTICS
TAREA .53 SUBBASIN AREA

PRECIPITATION DATA

26 PB STORM 3.43 BASIN TOTAL PRECIPITATION

27 PI INCREMENTAL PRECIPITATION PATTERN

.02	.04	.01	.02	.02	.02	.01	.00	.00	.00
.00	.00	.00	.01	.00	.01	.01	.01	.01	.01
.01	.00	.00	.00	.00	.01	.02	.01	.01	.00
.01	.01	.01	.00	.00	.01	.03	.03	.06	.09
.09	.12	.03	.04	.03	.01	.02	.02	.00	.00
.01	.01	.01	.02	.02	.01	.01	.02	.01	.01
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00								

43 LS SCS LOSS RATE

STRTL	.30	INITIAL ABSTRACTION
CRVNBR	86.80	CURVE NUMBER
RTIMP	.00	PERCENT IMPERVIOUS AREA

44 UD SCS DIMENSIONLESS UNITGRAPH

TLAG	.16	LAG

***

WARNING *** TIME INTERVAL IS GREATER THAN .29*LAG

UNIT HYDROGRAPH
11 END-OF-PERIOD ORDINATES

458.	1260.	1157.	612.	311.	156.	77.	39.	19.	11.
4.									

****

HYDROGRAPH AT STATION 4

****

DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q	DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q
1		0000	1	.00	.00	.00	0.	1		1230	151	.00	.00	.00	0.
1		0005	2	.07	.07	.00	0.	1		1235	152	.00	.00	.00	0.
1		0010	3	.13	.13	.00	0.	1		1240	153	.00	.00	.00	0.
1		0015	4	.04	.04	.00	0.	1		1245	154	.00	.00	.00	0.
1		0020	5	.06	.06	.00	0.	1		1250	155	.00	.00	.00	0.
1		0025	6	.07	.07	.00	1.	1		1255	156	.00	.00	.00	0.
1		0030	7	.05	.05	.01	6.	1		1300	157	.00	.00	.00	0.
1		0035	8	.02	.02	.00	12.	1		1305	158	.00	.00	.00	0.
1		0040	9	.00	.00	.00	13.	1		1310	159	.00	.00	.00	0.
1		0045	10	.00	.00	.00	8.	1		1315	160	.00	.00	.00	0.
1		0050	11	.00	.00	.00	4.	1		1320	161	.00	.00	.00	0.
1		0055	12	.00	.00	.00	2.	1		1325	162	.00	.00	.00	0.
1		0100	13	.00	.00	.00	1.	1		1330	163	.00	.00	.00	0.
1		0105	14	.01	.01	.00	1.	1		1335	164	.00	.00	.00	0.
1		0110	15	.02	.02	.00	4.	1		1340	165	.00	.00	.00	0.
1		0115	16	.01	.01	.00	8.	1		1345	166	.00	.00	.00	0.
1		0120	17	.02	.02	.00	10.	1		1350	167	.00	.00	.00	0.
1		0125	18	.03	.03	.01	14.	1		1355	168	.00	.00	.00	0.
1		0130	19	.05	.03	.01	24.	1		1400	169	.00	.00	.00	0.
1		0135	20	.03	.02	.01	34.	1		1405	170	.00	.00	.00	0.
1		0140	21	.03	.02	.01	38.	1		1410	171	.00	.00	.00	0.
1		0145	22	.02	.02	.01	39.	1		1415	172	.00	.00	.00	0.
1		0150	23	.01	.00	.00	35.	1		1420	173	.00	.00	.00	0.
1		0155	24	.00	.00	.00	25.	1		1425	174	.00	.00	.00	0.
1		0200	25	.00	.00	.00	16.	1		1430	175	.00	.00	.00	0.
1		0205	26	.01	.01	.00	12.	1		1435	176	.00	.00	.00	0.
1		0210	27	.03	.02	.01	16.	1		1440	177	.00	.00	.00	0.
1		0215	28	.05	.03	.02	33.	1		1445	178	.00	.00	.00	0.
1		0220	29	.04	.02	.02	54.	1		1450	179	.00	.00	.00	0.
1		0225	30	.03	.01	.01	62.	1		1455	180	.00	.00	.00	0.
1		0230	31	.01	.00	.00	56.	1		1500	181	.00	.00	.00	0.
1		0235	32	.02	.01	.01	42.	1		1505	182	.00	.00	.00	0.
1		0240	33	.05	.02	.02	42.	1		1510	183	.00	.00	.00	0.
1		0245	34	.03	.01	.01	56.	1		1515	184	.00	.00	.00	0.
1		0250	35	.01	.01	.01	57.	1		1520	185	.00	.00	.00	0.
1		0255	36	.01	.00	.00	44.	1		1525	186	.00	.00	.00	0.
1		0300	37	.04	.02	.02	39.	1		1530	187	.00	.00	.00	0.
1		0305	38	.09	.04	.05	67.	1		1535	188	.00	.00	.00	0.
1		0310	39	.10	.04	.06	126.	1		1540	189	.00	.00	.00	0.
1		0315	40	.20	.07	.12	210.	1		1545	190	.00	.00	.00	0.
1		0320	41	.31	.09	.22	366.	1		1550	191	.00	.00	.00	0.
1		0325	42	.31	.08	.24	581.	1		1555	192	.00	.00	.00	0.
1		0330	43	.41	.08	.33	804.	1		1600	193	.00	.00	.00	0.
1		0335	44	.12	.02	.10	920.	1		1605	194	.00	.00	.00	0.
1		0340	45	.13	.02	.11	792.	1		1610	195	.00	.00	.00	0.
1		0345	46	.11	.02	.09	611.	1		1615	196	.00	.00	.00	0.
1		0350	47	.02	.00	.02	470.	1		1620	197	.00	.00	.00	0.
1		0355	48	.05	.01	.05	329.	1		1625	198	.00	.00	.00	0.
1		0400	49	.05	.01	.05	249.	1		1630	199	.00	.00	.00	0.
1		0405	50	.02	.00	.01	206.	1		1635	200	.00	.00	.00	0.
1		0410	51	.01	.00	.01	150.	1		1640	201	.00	.00	.00	0.
1		0415	52	.03	.00	.02	108.	1		1645	202	.00	.00	.00	0.
1		0420	53	.03	.00	.02	96.	1		1650	203	.00	.00	.00	0.
1		0425	54	.04	.01	.04	101.	1		1655	204	.00	.00	.00	0.
1		0430	55	.08	.01	.07	131.	1		1700	205	.00	.00	.00	0.
1		0435	56	.05	.01	.05	175.	1		1705	206	.00	.00	.00	0.
1		0440	57	.04	.00	.03	188.	1		1710	207	.00	.00	.00	0.
1		0445	58	.04	.01	.04	174.	1		1715	208	.00	.00	.00	0.
1		0450	59	.07	.01	.06	175.	1		1720	209	.00	.00	.00	0.

1	0455	60	.02	.00	.02	181.	*	1	1725	210	.00	.00	.00	0.
1	0500	61	.02	.00	.02	151.	*	1	1730	211	.00	.00	.00	0.
1	0505	62	.01	.00	.01	110.	*	1	1735	212	.00	.00	.00	0.
1	0510	63	.01	.00	.01	78.	*	1	1740	213	.00	.00	.00	0.
1	0515	64	.01	.00	.01	54.	*	1	1745	214	.00	.00	.00	0.
1	0520	65	.00	.00	.00	38.	*	1	1750	215	.00	.00	.00	0.
1	0525	66	.01	.00	.01	30.	*	1	1755	216	.00	.00	.00	0.
1	0530	67	.00	.00	.00	26.	*	1	1800	217	.00	.00	.00	0.
1	0535	68	.00	.00	.00	19.	*	1	1805	218	.00	.00	.00	0.
1	0540	69	.00	.00	.00	14.	*	1	1810	219	.00	.00	.00	0.
1	0545	70	.01	.00	.01	16.	*	1	1815	220	.00	.00	.00	0.
1	0550	71	.00	.00	.00	19.	*	1	1820	221	.00	.00	.00	0.
1	0555	72	.00	.00	.00	16.	*	1	1825	222	.00	.00	.00	0.
1	0600	73	.00	.00	.00	13.	*	1	1830	223	.00	.00	.00	0.
1	0605	74	.00	.00	.00	11.	*	1	1835	224	.00	.00	.00	0.
1	0610	75	.00	.00	.00	7.	*	1	1840	225	.00	.00	.00	0.
1	0615	76	.00	.00	.00	4.	*	1	1845	226	.00	.00	.00	0.
1	0620	77	.00	.00	.00	2.	*	1	1850	227	.00	.00	.00	0.
1	0625	78	.00	.00	.00	1.	*	1	1855	228	.00	.00	.00	0.
1	0630	79	.00	.00	.00	0.	*	1	1900	229	.00	.00	.00	0.
1	0635	80	.00	.00	.00	0.	*	1	1905	230	.00	.00	.00	0.
1	0640	81	.00	.00	.00	0.	*	1	1910	231	.00	.00	.00	0.
1	0645	82	.00	.00	.00	0.	*	1	1915	232	.00	.00	.00	0.
1	0650	83	.00	.00	.00	0.	*	1	1920	233	.00	.00	.00	0.
1	0655	84	.00	.00	.00	0.	*	1	1925	234	.00	.00	.00	0.
1	0700	85	.00	.00	.00	0.	*	1	1930	235	.00	.00	.00	0.
1	0705	86	.00	.00	.00	0.	*	1	1935	236	.00	.00	.00	0.
1	0710	87	.00	.00	.00	0.	*	1	1940	237	.00	.00	.00	0.
1	0715	88	.00	.00	.00	0.	*	1	1945	238	.00	.00	.00	0.
1	0720	89	.00	.00	.00	0.	*	1	1950	239	.00	.00	.00	0.
1	0725	90	.00	.00	.00	0.	*	1	1955	240	.00	.00	.00	0.
1	0730	91	.00	.00	.00	0.	*	1	2000	241	.00	.00	.00	0.
1	0735	92	.00	.00	.00	0.	*	1	2005	242	.00	.00	.00	0.
1	0740	93	.00	.00	.00	0.	*	1	2010	243	.00	.00	.00	0.
1	0745	94	.00	.00	.00	0.	*	1	2015	244	.00	.00	.00	0.
1	0750	95	.00	.00	.00	0.	*	1	2020	245	.00	.00	.00	0.
1	0755	96	.00	.00	.00	0.	*	1	2025	246	.00	.00	.00	0.
1	0800	97	.00	.00	.00	0.	*	1	2030	247	.00	.00	.00	0.
1	0805	98	.00	.00	.00	0.	*	1	2035	248	.00	.00	.00	0.
1	0810	99	.00	.00	.00	0.	*	1	2040	249	.00	.00	.00	0.
1	0815	100	.00	.00	.00	0.	*	1	2045	250	.00	.00	.00	0.
1	0820	101	.00	.00	.00	0.	*	1	2050	251	.00	.00	.00	0.
1	0825	102	.00	.00	.00	0.	*	1	2055	252	.00	.00	.00	0.
1	0830	103	.00	.00	.00	0.	*	1	2100	253	.00	.00	.00	0.
1	0835	104	.00	.00	.00	0.	*	1	2105	254	.00	.00	.00	0.
1	0840	105	.00	.00	.00	0.	*	1	2110	255	.00	.00	.00	0.
1	0845	106	.00	.00	.00	0.	*	1	2115	256	.00	.00	.00	0.
1	0850	107	.00	.00	.00	0.	*	1	2120	257	.00	.00	.00	0.
1	0855	108	.00	.00	.00	0.	*	1	2125	258	.00	.00	.00	0.
1	0900	109	.00	.00	.00	0.	*	1	2130	259	.00	.00	.00	0.
1	0905	110	.00	.00	.00	0.	*	1	2135	260	.00	.00	.00	0.
1	0910	111	.00	.00	.00	0.	*	1	2140	261	.00	.00	.00	0.
1	0915	112	.00	.00	.00	0.	*	1	2145	262	.00	.00	.00	0.
1	0920	113	.00	.00	.00	0.	*	1	2150	263	.00	.00	.00	0.
1	0925	114	.00	.00	.00	0.	*	1	2155	264	.00	.00	.00	0.
1	0930	115	.00	.00	.00	0.	*	1	2200	265	.00	.00	.00	0.
1	0935	116	.00	.00	.00	0.	*	1	2205	266	.00	.00	.00	0.
1	0940	117	.00	.00	.00	0.	*	1	2210	267	.00	.00	.00	0.
1	0945	118	.00	.00	.00	0.	*	1	2215	268	.00	.00	.00	0.
1	0950	119	.00	.00	.00	0.	*	1	2220	269	.00	.00	.00	0.
1	0955	120	.00	.00	.00	0.	*	1	2225	270	.00	.00	.00	0.
1	1000	121	.00	.00	.00	0.	*	1	2230	271	.00	.00	.00	0.
1	1005	122	.00	.00	.00	0.	*	1	2235	272	.00	.00	.00	0.
1	1010	123	.00	.00	.00	0.	*	1	2240	273	.00	.00	.00	0.
1	1015	124	.00	.00	.00	0.	*	1	2245	274	.00	.00	.00	0.
1	1020	125	.00	.00	.00	0.	*	1	2250	275	.00	.00	.00	0.
1	1025	126	.00	.00	.00	0.	*	1	2255	276	.00	.00	.00	0.
1	1030	127	.00	.00	.00	0.	*	1	2300	277	.00	.00	.00	0.
1	1035	128	.00	.00	.00	0.	*	1	2305	278	.00	.00	.00	0.
1	1040	129	.00	.00	.00	0.	*	1	2310	279	.00	.00	.00	0.
1	1045	130	.00	.00	.00	0.	*	1	2315	280	.00	.00	.00	0.
1	1050	131	.00	.00	.00	0.	*	1	2320	281	.00	.00	.00	0.
1	1055	132	.00	.00	.00	0.	*	1	2325	282	.00	.00	.00	0.
1	1100	133	.00	.00	.00	0.	*	1	2330	283	.00	.00	.00	0.
1	1105	134	.00	.00	.00	0.	*	1	2335	284	.00	.00	.00	0.
1	1110	135	.00	.00	.00	0.	*	1	2340	285	.00	.00	.00	0.
1	1115	136	.00	.00	.00	0.	*	1	2345	286	.00	.00	.00	0.
1	1120	137	.00	.00	.00	0.	*	1	2350	287	.00	.00	.00	0.
1	1125	138	.00	.00	.00	0.	*	1	2355	288	.00	.00	.00	0.
1	1130	139	.00	.00	.00	0.	*	2	0000	289	.00	.00	.00	0.
1	1135	140	.00	.00	.00	0.	*	2	0005	290	.00	.00	.00	0.
1	1140	141	.00	.00	.00	0.	*	2	0010	291	.00	.00	.00	0.
1	1145	142	.00	.00	.00	0.	*	2	0015	292	.00	.00	.00	0.
1	1150	143	.00	.00	.00	0.	*	2	0020	293	.00	.00	.00	0.
1	1155	144	.00	.00	.00	0.	*	2	0025	294	.00	.00	.00	0.
1	1200	145	.00	.00	.00	0.	*	2	0030	295	.00	.00	.00	0.
1	1205	146	.00	.00	.00	0.	*	2	0035	296	.00	.00	.00	0.
1	1210	147	.00	.00	.00	0.	*	2	0040	297	.00	.00	.00	0.
1	1215	148	.00	.00	.00	0.	*	2	0045	298	.00	.00	.00	0.
1	1220	149	.00	.00	.00	0.	*	2	0050	299	.00	.00	.00	0.
1	1225	150	.00	.00	.00	0.	*	2	0055	300	.00	.00	.00	0.
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TOTAL RAINFALL = 3.43, TOTAL LOSS = 1.33, TOTAL EXCESS = 2.10

PEAK FLOW TIME MAXIMUM AVERAGE FLOW

+ (CFS)	(HR)		6-HR	24-HR	72-HR	24.92-HR
		(CFS)	.			
+ 920.	3.58		120.	30.	29.	29.
		(INCHES)	2.102	2.103	2.103	2.103
		(AC-FT)	59.	59.	59.	59.

CUMULATIVE AREA = .53 SQ MI

WARNING *** TIME INTERVAL IS GREATER THAN .29*LAG

HYDROGRAPH AT STATION 4
PLAN 1, RATIO = .90

DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q	DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q
1		0000	1	.00	.00	.00	0.	1		1230	151	.00	.00	.00	0.
1		0005	2	.06	.06	.00	0.	1		1235	152	.00	.00	.00	0.
1		0010	3	.11	.11	.00	0.	1		1240	153	.00	.00	.00	0.
1		0015	4	.04	.04	.00	0.	1		1245	154	.00	.00	.00	0.
1		0020	5	.05	.05	.00	0.	1		1250	155	.00	.00	.00	0.
1		0025	6	.06	.06	.00	0.	1		1255	156	.00	.00	.00	0.
1		0030	7	.05	.05	.00	2.	1		1300	157	.00	.00	.00	0.
1		0035	8	.02	.02	.00	6.	1		1305	158	.00	.00	.00	0.
1		0040	9	.00	.00	.00	7.	1		1310	159	.00	.00	.00	0.
1		0045	10	.00	.00	.00	4.	1		1315	160	.00	.00	.00	0.
1		0050	11	.00	.00	.00	2.	1		1320	161	.00	.00	.00	0.
1		0055	12	.00	.00	.00	1.	1		1325	162	.00	.00	.00	0.
1		0100	13	.00	.00	.00	1.	1		1330	163	.00	.00	.00	0.
1		0105	14	.01	.01	.00	1.	1		1335	164	.00	.00	.00	0.
1		0110	15	.02	.02	.00	3.	1		1340	165	.00	.00	.00	0.
1		0115	16	.01	.01	.00	6.	1		1345	166	.00	.00	.00	0.
1		0120	17	.02	.02	.00	7.	1		1350	167	.00	.00	.00	0.
1		0125	18	.03	.03	.01	10.	1		1355	168	.00	.00	.00	0.
1		0130	19	.04	.03	.01	17.	1		1400	169	.00	.00	.00	0.
1		0135	20	.03	.02	.01	25.	1		1405	170	.00	.00	.00	0.
1		0140	21	.03	.02	.01	29.	1		1410	171	.00	.00	.00	0.
1		0145	22	.02	.02	.01	29.	1		1415	172	.00	.00	.00	0.
1		0150	23	.01	.00	.00	26.	1		1420	173	.00	.00	.00	0.
1		0155	24	.00	.00	.00	19.	1		1425	174	.00	.00	.00	0.
1		0200	25	.00	.00	.00	12.	1		1430	175	.00	.00	.00	0.
1		0205	26	.01	.01	.00	9.	1		1435	176	.00	.00	.00	0.
1		0210	27	.03	.02	.01	13.	1		1440	177	.00	.00	.00	0.
1		0215	28	.05	.03	.02	26.	1		1445	178	.00	.00	.00	0.
1		0220	29	.04	.02	.01	42.	1		1450	179	.00	.00	.00	0.
1		0225	30	.02	.01	.01	50.	1		1455	180	.00	.00	.00	0.
1		0230	31	.01	.00	.00	44.	1		1500	181	.00	.00	.00	0.
1		0235	32	.02	.01	.01	34.	1		1505	182	.00	.00	.00	0.
1		0240	33	.04	.02	.02	34.	1		1510	183	.00	.00	.00	0.
1		0245	34	.02	.01	.01	45.	1		1515	184	.00	.00	.00	0.
1		0250	35	.01	.00	.00	46.	1		1520	185	.00	.00	.00	0.
1		0255	36	.01	.00	.00	36.	1		1525	186	.00	.00	.00	0.
1		0300	37	.04	.02	.02	32.	1		1530	187	.00	.00	.00	0.
1		0305	38	.08	.04	.04	55.	1		1535	188	.00	.00	.00	0.
1		0310	39	.09	.04	.05	104.	1		1540	189	.00	.00	.00	0.
1		0315	40	.18	.07	.10	175.	1		1545	190	.00	.00	.00	0.
1		0320	41	.28	.09	.18	308.	1		1550	191	.00	.00	.00	0.
1		0325	42	.28	.08	.20	494.	1		1555	192	.00	.00	.00	0.
1		0330	43	.37	.08	.29	689.	1		1600	193	.00	.00	.00	0.
1		0335	44	.10	.02	.08	794.	1		1605	194	.00	.00	.00	0.
1		0340	45	.11	.02	.09	686.	1		1610	195	.00	.00	.00	0.
1		0345	46	.10	.02	.08	531.	1		1615	196	.00	.00	.00	0.
1		0350	47	.02	.00	.02	409.	1		1620	197	.00	.00	.00	0.
1		0355	48	.05	.01	.04	287.	1		1625	198	.00	.00	.00	0.
1		0400	49	.05	.01	.04	218.	1		1630	199	.00	.00	.00	0.
1		0405	50	.02	.00	.01	181.	1		1635	200	.00	.00	.00	0.
1		0410	51	.01	.00	.01	132.	1		1640	201	.00	.00	.00	0.
1		0415	52	.02	.00	.02	94.	1		1645	202	.00	.00	.00	0.
1		0420	53	.02	.00	.02	84.	1		1650	203	.00	.00	.00	0.
1		0425	54	.04	.01	.03	89.	1		1655	204	.00	.00	.00	0.
1		0430	55	.07	.01	.06	115.	1		1700	205	.00	.00	.00	0.
1		0435	56	.05	.01	.04	154.	1		1705	206	.00	.00	.00	0.
1		0440	57	.03	.00	.03	166.	1		1710	207	.00	.00	.00	0.
1		0445	58	.04	.01	.03	153.	1		1715	208	.00	.00	.00	0.
1		0450	59	.06	.01	.05	154.	1		1720	209	.00	.00	.00	0.
1		0455	60	.02	.00	.02	159.	1		1725	210	.00	.00	.00	0.
1		0500	61	.02	.00	.02	133.	1		1730	211	.00	.00	.00	0.
1		0505	62	.01	.00	.01	97.	1		1735	212	.00	.00	.00	0.
1		0510	63	.01	.00	.01	69.	1		1740	213	.00	.00	.00	0.
1		0515	64	.01	.00	.01	47.	1		1745	214	.00	.00	.00	0.
1		0520	65	.00	.00	.00	33.	1		1750	215	.00	.00	.00	0.
1		0525	66	.01	.00	.01	26.	1		1755	216	.00	.00	.00	0.
1		0530	67	.00	.00	.00	23.	1		1800	217	.00	.00	.00	0.
1		0535	68	.00	.00	.00	17.	1		1805	218	.00	.00	.00	0.
1		0540	69	.00	.00	.00	13.	1		1810	219	.00	.00	.00	0.
1		0545	70	.01	.00	.01	14.	1		1815	220	.00	.00	.00	0.
1		0550	71	.00	.00	.00	17.	1		1820	221	.00	.00	.00	0.
1		0555	72	.00	.00	.00	14.	1		1825	222	.00	.00	.00	0.
1		0600	73	.00	.00	.00	11.	1		1830	223	.00	.00	.00	0.
1		0605	74	.00	.00	.00	10.	1		1835	224	.00	.00	.00	0.

1	0610	75	.00	.00	.00	6.	*	1	1840	225	.00	.00	.00	0.
1	0615	76	.00	.00	.00	3.	*	1	1845	226	.00	.00	.00	0.
1	0620	77	.00	.00	.00	2.	*	1	1850	227	.00	.00	.00	0.
1	0625	78	.00	.00	.00	1.	*	1	1855	228	.00	.00	.00	0.
1	0630	79	.00	.00	.00	0.	*	1	1900	229	.00	.00	.00	0.
1	0635	80	.00	.00	.00	0.	*	1	1905	230	.00	.00	.00	0.
1	0640	81	.00	.00	.00	0.	*	1	1910	231	.00	.00	.00	0.
1	0645	82	.00	.00	.00	0.	*	1	1915	232	.00	.00	.00	0.
1	0650	83	.00	.00	.00	0.	*	1	1920	233	.00	.00	.00	0.
1	0655	84	.00	.00	.00	0.	*	1	1925	234	.00	.00	.00	0.
1	0700	85	.00	.00	.00	0.	*	1	1930	235	.00	.00	.00	0.
1	0705	86	.00	.00	.00	0.	*	1	1935	236	.00	.00	.00	0.
1	0710	87	.00	.00	.00	0.	*	1	1940	237	.00	.00	.00	0.
1	0715	88	.00	.00	.00	0.	*	1	1945	238	.00	.00	.00	0.
1	0720	89	.00	.00	.00	0.	*	1	1950	239	.00	.00	.00	0.
1	0725	90	.00	.00	.00	0.	*	1	1955	240	.00	.00	.00	0.
1	0730	91	.00	.00	.00	0.	*	1	2000	241	.00	.00	.00	0.
1	0735	92	.00	.00	.00	0.	*	1	2005	242	.00	.00	.00	0.
1	0740	93	.00	.00	.00	0.	*	1	2010	243	.00	.00	.00	0.
1	0745	94	.00	.00	.00	0.	*	1	2015	244	.00	.00	.00	0.
1	0750	95	.00	.00	.00	0.	*	1	2020	245	.00	.00	.00	0.
1	0755	96	.00	.00	.00	0.	*	1	2025	246	.00	.00	.00	0.
1	0800	97	.00	.00	.00	0.	*	1	2030	247	.00	.00	.00	0.
1	0805	98	.00	.00	.00	0.	*	1	2035	248	.00	.00	.00	0.
1	0810	99	.00	.00	.00	0.	*	1	2040	249	.00	.00	.00	0.
1	0815	100	.00	.00	.00	0.	*	1	2045	250	.00	.00	.00	0.
1	0820	101	.00	.00	.00	0.	*	1	2050	251	.00	.00	.00	0.
1	0825	102	.00	.00	.00	0.	*	1	2055	252	.00	.00	.00	0.
1	0830	103	.00	.00	.00	0.	*	1	2100	253	.00	.00	.00	0.
1	0835	104	.00	.00	.00	0.	*	1	2105	254	.00	.00	.00	0.
1	0840	105	.00	.00	.00	0.	*	1	2110	255	.00	.00	.00	0.
1	0845	106	.00	.00	.00	0.	*	1	2115	256	.00	.00	.00	0.
1	0850	107	.00	.00	.00	0.	*	1	2120	257	.00	.00	.00	0.
1	0855	108	.00	.00	.00	0.	*	1	2125	258	.00	.00	.00	0.
1	0900	109	.00	.00	.00	0.	*	1	2130	259	.00	.00	.00	0.
1	0905	110	.00	.00	.00	0.	*	1	2135	260	.00	.00	.00	0.
1	0910	111	.00	.00	.00	0.	*	1	2140	261	.00	.00	.00	0.
1	0915	112	.00	.00	.00	0.	*	1	2145	262	.00	.00	.00	0.
1	0920	113	.00	.00	.00	0.	*	1	2150	263	.00	.00	.00	0.
1	0925	114	.00	.00	.00	0.	*	1	2155	264	.00	.00	.00	0.
1	0930	115	.00	.00	.00	0.	*	1	2200	265	.00	.00	.00	0.
1	0935	116	.00	.00	.00	0.	*	1	2205	266	.00	.00	.00	0.
1	0940	117	.00	.00	.00	0.	*	1	2210	267	.00	.00	.00	0.
1	0945	118	.00	.00	.00	0.	*	1	2215	268	.00	.00	.00	0.
1	0950	119	.00	.00	.00	0.	*	1	2220	269	.00	.00	.00	0.
1	0955	120	.00	.00	.00	0.	*	1	2225	270	.00	.00	.00	0.
1	1000	121	.00	.00	.00	0.	*	1	2230	271	.00	.00	.00	0.
1	1005	122	.00	.00	.00	0.	*	1	2235	272	.00	.00	.00	0.
1	1010	123	.00	.00	.00	0.	*	1	2240	273	.00	.00	.00	0.
1	1015	124	.00	.00	.00	0.	*	1	2245	274	.00	.00	.00	0.
1	1020	125	.00	.00	.00	0.	*	1	2250	275	.00	.00	.00	0.
1	1025	126	.00	.00	.00	0.	*	1	2255	276	.00	.00	.00	0.
1	1030	127	.00	.00	.00	0.	*	1	2300	277	.00	.00	.00	0.
1	1035	128	.00	.00	.00	0.	*	1	2305	278	.00	.00	.00	0.
1	1040	129	.00	.00	.00	0.	*	1	2310	279	.00	.00	.00	0.
1	1045	130	.00	.00	.00	0.	*	1	2315	280	.00	.00	.00	0.
1	1050	131	.00	.00	.00	0.	*	1	2320	281	.00	.00	.00	0.
1	1055	132	.00	.00	.00	0.	*	1	2325	282	.00	.00	.00	0.
1	1100	133	.00	.00	.00	0.	*	1	2330	283	.00	.00	.00	0.
1	1105	134	.00	.00	.00	0.	*	1	2335	284	.00	.00	.00	0.
1	1110	135	.00	.00	.00	0.	*	1	2340	285	.00	.00	.00	0.
1	1115	136	.00	.00	.00	0.	*	1	2345	286	.00	.00	.00	0.
1	1120	137	.00	.00	.00	0.	*	1	2350	287	.00	.00	.00	0.
1	1125	138	.00	.00	.00	0.	*	1	2355	288	.00	.00	.00	0.
1	1130	139	.00	.00	.00	0.	*	2	0000	289	.00	.00	.00	0.
1	1135	140	.00	.00	.00	0.	*	2	0005	290	.00	.00	.00	0.
1	1140	141	.00	.00	.00	0.	*	2	0010	291	.00	.00	.00	0.
1	1145	142	.00	.00	.00	0.	*	2	0015	292	.00	.00	.00	0.
1	1150	143	.00	.00	.00	0.	*	2	0020	293	.00	.00	.00	0.
1	1155	144	.00	.00	.00	0.	*	2	0025	294	.00	.00	.00	0.
1	1200	145	.00	.00	.00	0.	*	2	0030	295	.00	.00	.00	0.
1	1205	146	.00	.00	.00	0.	*	2	0035	296	.00	.00	.00	0.
1	1210	147	.00	.00	.00	0.	*	2	0040	297	.00	.00	.00	0.
1	1215	148	.00	.00	.00	0.	*	2	0045	298	.00	.00	.00	0.
1	1220	149	.00	.00	.00	0.	*	2	0050	299	.00	.00	.00	0.
1	1225	150	.00	.00	.00	0.	*	2	0055	300	.00	.00	.00	0.

*

TOTAL RAINFALL = 3.09, TOTAL LOSS = 1.29, TOTAL EXCESS = 1.80

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.92-HR
+ (CFS)	(HR)					
		(CFS)				
+ 794.	3.58		103.	26.	25.	25.
		(INCHES)	1.799	1.799	1.799	1.799
		(AC-FT)	51.	51.	51.	51.

CUMULATIVE AREA = .53 SQ MI

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          **************
          *            *
45 KK     *          5 *
          *            *
          **************

          SUBBASIN RUNOFF DATA

46 BA       SUBBASIN CHARACTERISTICS
              TAREA         1.43  SUBBASIN AREA

            PRECIPITATION DATA

26 PB         STORM         3.43  BASIN TOTAL PRECIPITATION

27 PI       INCREMENTAL PRECIPITATION PATTERN
              .02    .04    .01    .02    .02    .02    .01    .00    .00    .00
              .00    .00    .00    .01    .00    .01    .01    .01    .01    .01
              .01    .00    .00    .00    .00    .01    .02    .01    .01    .00
              .01    .01    .01    .00    .00    .01    .03    .03    .06    .09
              .09    .12    .03    .04    .03    .01    .02    .02    .00    .00
              .01    .01    .01    .02    .02    .01    .01    .02    .01    .01
              .00    .00    .00    .00    .00    .00    .00    .00    .00    .00
              .00    .00

47 LS       SCS LOSS RATE
              STRTL          .28  INITIAL ABSTRACTION
              CRVNBR       87.70  CURVE NUMBER
              RTIMP          .00  PERCENT IMPERVIOUS AREA

48 UD       SCS DIMENSIONLESS UNITGRAPH
              TLAG           .37  LAG

                                  ***

                                UNIT HYDROGRAPH
                            24 END-OF-PERIOD ORDINATES
          167.    518.   1102.   1550.   1664.   1544.   1292.    925.    645.    463.
          342.    243.    176.    127.     91.     66.     48.     35.     25.     18.
           14.     10.      6.      3.
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HYDROGRAPH AT STATION 5

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DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q	DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q
1		0000	1	.00	.00	.00	0.	1		1230	151	.00	.00	.00	0.
1		0005	2	.07	.07	.00	0.	1		1235	152	.00	.00	.00	0.
1		0010	3	.13	.13	.00	0.	1		1240	153	.00	.00	.00	0.
1		0015	4	.04	.04	.00	0.	1		1245	154	.00	.00	.00	0.
1		0020	5	.06	.06	.00	0.	1		1250	155	.00	.00	.00	0.
1		0025	6	.07	.07	.01	1.	1		1255	156	.00	.00	.00	0.
1		0030	7	.05	.05	.01	4.	1		1300	157	.00	.00	.00	0.
1		0035	8	.02	.02	.00	11.	1		1305	158	.00	.00	.00	0.
1		0040	9	.00	.00	.00	19.	1		1310	159	.00	.00	.00	0.
1		0045	10	.00	.00	.00	26.	1		1315	160	.00	.00	.00	0.
1		0050	11	.00	.00	.00	28.	1		1320	161	.00	.00	.00	0.
1		0055	12	.00	.00	.00	26.	1		1325	162	.00	.00	.00	0.
1		0100	13	.00	.00	.00	21.	1		1330	163	.00	.00	.00	0.
1		0105	14	.01	.01	.00	16.	1		1335	164	.00	.00	.00	0.
1		0110	15	.02	.02	.01	13.	1		1340	165	.00	.00	.00	0.
1		0115	16	.01	.01	.00	13.	1		1345	166	.00	.00	.00	0.
1		0120	17	.02	.02	.01	17.	1		1350	167	.00	.00	.00	0.
1		0125	18	.03	.02	.01	22.	1		1355	168	.00	.00	.00	0.
1		0130	19	.05	.03	.01	31.	1		1400	169	.00	.00	.00	0.
1		0135	20	.03	.02	.01	44.	1		1405	170	.00	.00	.00	0.
1		0140	21	.03	.02	.01	60.	1		1410	171	.00	.00	.00	0.
1		0145	22	.02	.01	.01	75.	1		1415	172	.00	.00	.00	0.
1		0150	23	.01	.00	.00	87.	1		1420	173	.00	.00	.00	0.
1		0155	24	.00	.00	.00	91.	1		1425	174	.00	.00	.00	0.
1		0200	25	.00	.00	.00	88.	1		1430	175	.00	.00	.00	0.
1		0205	26	.01	.01	.00	78.	1		1435	176	.00	.00	.00	0.
1		0210	27	.03	.02	.01	69.	1		1440	177	.00	.00	.00	0.
1		0215	28	.05	.03	.02	66.	1		1445	178	.00	.00	.00	0.
1		0220	29	.04	.02	.02	75.	1		1450	179	.00	.00	.00	0.
1		0225	30	.03	.01	.01	94.	1		1455	180	.00	.00	.00	0.
1		0230	31	.01	.00	.00	115.	1		1500	181	.00	.00	.00	0.
1		0235	32	.02	.01	.01	128.	1		1505	182	.00	.00	.00	0.
1		0240	33	.05	.02	.02	134.	1		1510	183	.00	.00	.00	0.
1		0245	34	.03	.01	.01	136.	1		1515	184	.00	.00	.00	0.
1		0250	35	.01	.00	.01	139.	1		1520	185	.00	.00	.00	0.
1		0255	36	.01	.00	.00	140.	1		1525	186	.00	.00	.00	0.
1		0300	37	.04	.02	.02	138.	1		1530	187	.00	.00	.00	0.
1		0305	38	.09	.04	.05	143.	1		1535	188	.00	.00	.00	0.
1		0310	39	.10	.04	.06	168.	1		1540	189	.00	.00	.00	0.
1		0315	40	.20	.07	.13	231.	1		1545	190	.00	.00	.00	0.
1		0320	41	.31	.08	.22	358.	1		1550	191	.00	.00	.00	0.
1		0325	42	.31	.07	.24	568.	1		1555	192	.00	.00	.00	0.
1		0330	43	.41	.07	.34	882.	1		1600	193	.00	.00	.00	0.
1		0335	44	.12	.02	.10	1236.	1		1605	194	.00	.00	.00	0.
1		0340	45	.13	.02	.11	1557.	1		1610	195	.00	.00	.00	0.

1	0345	46	.11	.01	.09	1742.	*	1	1615	196	.00	.00	.00	0.
1	0350	47	.02	.00	.02	1757.	*	1	1620	197	.00	.00	.00	0.
1	0355	48	.05	.01	.05	1643.	*	1	1625	198	.00	.00	.00	0.
1	0400	49	.05	.01	.05	1445.	*	1	1630	199	.00	.00	.00	0.
1	0405	50	.02	.00	.02	1213.	*	1	1635	200	.00	.00	.00	0.
1	0410	51	.01	.00	.01	1009.	*	1	1640	201	.00	.00	.00	0.
1	0415	52	.03	.00	.02	831.	*	1	1645	202	.00	.00	.00	0.
1	0420	53	.03	.00	.02	679.	*	1	1650	203	.00	.00	.00	0.
1	0425	54	.04	.00	.04	563.	*	1	1655	204	.00	.00	.00	0.
1	0430	55	.08	.01	.07	488.	*	1	1700	205	.00	.00	.00	0.
1	0435	56	.05	.01	.05	450.	*	1	1705	206	.00	.00	.00	0.
1	0440	57	.04	.00	.03	448.	*	1	1710	207	.00	.00	.00	0.
1	0445	58	.04	.00	.04	462.	*	1	1715	208	.00	.00	.00	0.
1	0450	59	.07	.01	.06	474.	*	1	1720	209	.00	.00	.00	0.
1	0455	60	.02	.00	.02	480.	*	1	1725	210	.00	.00	.00	0.
1	0500	61	.02	.00	.02	478.	*	1	1730	211	.00	.00	.00	0.
1	0505	62	.01	.00	.01	455.	*	1	1735	212	.00	.00	.00	0.
1	0510	63	.01	.00	.01	412.	*	1	1740	213	.00	.00	.00	0.
1	0515	64	.01	.00	.01	358.	*	1	1745	214	.00	.00	.00	0.
1	0520	65	.00	.00	.00	298.	*	1	1750	215	.00	.00	.00	0.
1	0525	66	.01	.00	.01	240.	*	1	1755	216	.00	.00	.00	0.
1	0530	67	.00	.00	.00	191.	*	1	1800	217	.00	.00	.00	0.
1	0535	68	.00	.00	.00	154.	*	1	1805	218	.00	.00	.00	0.
1	0540	69	.00	.00	.00	124.	*	1	1810	219	.00	.00	.00	0.
1	0545	70	.01	.00	.01	101.	*	1	1815	220	.00	.00	.00	0.
1	0550	71	.00	.00	.00	85.	*	1	1820	221	.00	.00	.00	0.
1	0555	72	.00	.00	.00	74.	*	1	1825	222	.00	.00	.00	0.
1	0600	73	.00	.00	.00	65.	*	1	1830	223	.00	.00	.00	0.
1	0605	74	.00	.00	.00	57.	*	1	1835	224	.00	.00	.00	0.
1	0610	75	.00	.00	.00	49.	*	1	1840	225	.00	.00	.00	0.
1	0615	76	.00	.00	.00	41.	*	1	1845	226	.00	.00	.00	0.
1	0620	77	.00	.00	.00	32.	*	1	1850	227	.00	.00	.00	0.
1	0625	78	.00	.00	.00	24.	*	1	1855	228	.00	.00	.00	0.
1	0630	79	.00	.00	.00	18.	*	1	1900	229	.00	.00	.00	0.
1	0635	80	.00	.00	.00	13.	*	1	1905	230	.00	.00	.00	0.
1	0640	81	.00	.00	.00	9.	*	1	1910	231	.00	.00	.00	0.
1	0645	82	.00	.00	.00	6.	*	1	1915	232	.00	.00	.00	0.
1	0650	83	.00	.00	.00	4.	*	1	1920	233	.00	.00	.00	0.
1	0655	84	.00	.00	.00	3.	*	1	1925	234	.00	.00	.00	0.
1	0700	85	.00	.00	.00	2.	*	1	1930	235	.00	.00	.00	0.
1	0705	86	.00	.00	.00	2.	*	1	1935	236	.00	.00	.00	0.
1	0710	87	.00	.00	.00	1.	*	1	1940	237	.00	.00	.00	0.
1	0715	88	.00	.00	.00	1.	*	1	1945	238	.00	.00	.00	0.
1	0720	89	.00	.00	.00	1.	*	1	1950	239	.00	.00	.00	0.
1	0725	90	.00	.00	.00	0.	*	1	1955	240	.00	.00	.00	0.
1	0730	91	.00	.00	.00	0.	*	1	2000	241	.00	.00	.00	0.
1	0735	92	.00	.00	.00	0.	*	1	2005	242	.00	.00	.00	0.
1	0740	93	.00	.00	.00	0.	*	1	2010	243	.00	.00	.00	0.
1	0745	94	.00	.00	.00	0.	*	1	2015	244	.00	.00	.00	0.
1	0750	95	.00	.00	.00	0.	*	1	2020	245	.00	.00	.00	0.
1	0755	96	.00	.00	.00	0.	*	1	2025	246	.00	.00	.00	0.
1	0800	97	.00	.00	.00	0.	*	1	2030	247	.00	.00	.00	0.
1	0805	98	.00	.00	.00	0.	*	1	2035	248	.00	.00	.00	0.
1	0810	99	.00	.00	.00	0.	*	1	2040	249	.00	.00	.00	0.
1	0815	100	.00	.00	.00	0.	*	1	2045	250	.00	.00	.00	0.
1	0820	101	.00	.00	.00	0.	*	1	2050	251	.00	.00	.00	0.
1	0825	102	.00	.00	.00	0.	*	1	2055	252	.00	.00	.00	0.
1	0830	103	.00	.00	.00	0.	*	1	2100	253	.00	.00	.00	0.
1	0835	104	.00	.00	.00	0.	*	1	2105	254	.00	.00	.00	0.
1	0840	105	.00	.00	.00	0.	*	1	2110	255	.00	.00	.00	0.
1	0845	106	.00	.00	.00	0.	*	1	2115	256	.00	.00	.00	0.
1	0850	107	.00	.00	.00	0.	*	1	2120	257	.00	.00	.00	0.
1	0855	108	.00	.00	.00	0.	*	1	2125	258	.00	.00	.00	0.
1	0900	109	.00	.00	.00	0.	*	1	2130	259	.00	.00	.00	0.
1	0905	110	.00	.00	.00	0.	*	1	2135	260	.00	.00	.00	0.
1	0910	111	.00	.00	.00	0.	*	1	2140	261	.00	.00	.00	0.
1	0915	112	.00	.00	.00	0.	*	1	2145	262	.00	.00	.00	0.
1	0920	113	.00	.00	.00	0.	*	1	2150	263	.00	.00	.00	0.
1	0925	114	.00	.00	.00	0.	*	1	2155	264	.00	.00	.00	0.
1	0930	115	.00	.00	.00	0.	*	1	2200	265	.00	.00	.00	0.
1	0935	116	.00	.00	.00	0.	*	1	2205	266	.00	.00	.00	0.
1	0940	117	.00	.00	.00	0.	*	1	2210	267	.00	.00	.00	0.
1	0945	118	.00	.00	.00	0.	*	1	2215	268	.00	.00	.00	0.
1	0950	119	.00	.00	.00	0.	*	1	2220	269	.00	.00	.00	0.
1	0955	120	.00	.00	.00	0.	*	1	2225	270	.00	.00	.00	0.
1	1000	121	.00	.00	.00	0.	*	1	2230	271	.00	.00	.00	0.
1	1005	122	.00	.00	.00	0.	*	1	2235	272	.00	.00	.00	0.
1	1010	123	.00	.00	.00	0.	*	1	2240	273	.00	.00	.00	0.
1	1015	124	.00	.00	.00	0.	*	1	2245	274	.00	.00	.00	0.
1	1020	125	.00	.00	.00	0.	*	1	2250	275	.00	.00	.00	0.
1	1025	126	.00	.00	.00	0.	*	1	2255	276	.00	.00	.00	0.
1	1030	127	.00	.00	.00	0.	*	1	2300	277	.00	.00	.00	0.
1	1035	128	.00	.00	.00	0.	*	1	2305	278	.00	.00	.00	0.
1	1040	129	.00	.00	.00	0.	*	1	2310	279	.00	.00	.00	0.
1	1045	130	.00	.00	.00	0.	*	1	2315	280	.00	.00	.00	0.
1	1050	131	.00	.00	.00	0.	*	1	2320	281	.00	.00	.00	0.
1	1055	132	.00	.00	.00	0.	*	1	2325	282	.00	.00	.00	0.
1	1100	133	.00	.00	.00	0.	*	1	2330	283	.00	.00	.00	0.
1	1105	134	.00	.00	.00	0.	*	1	2335	284	.00	.00	.00	0.
1	1110	135	.00	.00	.00	0.	*	1	2340	285	.00	.00	.00	0.
1	1115	136	.00	.00	.00	0.	*	1	2345	286	.00	.00	.00	0.
1	1120	137	.00	.00	.00	0.	*	1	2350	287	.00	.00	.00	0.
1	1125	138	.00	.00	.00	0.	*	1	2355	288	.00	.00	.00	0.
1	1130	139	.00	.00	.00	0.	*	2	0000	289	.00	.00	.00	0.
1	1135	140	.00	.00	.00	0.	*	2	0005	290	.00	.00	.00	0.
1	1140	141	.00	.00	.00	0.	*	2	0010	291	.00	.00	.00	0.
1	1145	142	.00	.00	.00	0.	*	2	0015	292	.00	.00	.00	0.
1	1150	143	.00	.00	.00	0.	*	2	0020	293	.00	.00	.00	0.
1	1155	144	.00	.00	.00	0.	*	2	0025	294	.00	.00	.00	0.

1	1200	145	.00	.00	.00	0.	*	2	0030	295	.00	.00	.00	0.
1	1205	146	.00	.00	.00	0.	*	2	0035	296	.00	.00	.00	0.
1	1210	147	.00	.00	.00	0.	*	2	0040	297	.00	.00	.00	0.
1	1215	148	.00	.00	.00	0.	*	2	0045	298	.00	.00	.00	0.
1	1220	149	.00	.00	.00	0.	*	2	0050	299	.00	.00	.00	0.
1	1225	150	.00	.00	.00	0.	*	2	0055	300	.00	.00	.00	0.
							*							

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TOTAL RAINFALL = 3.43, TOTAL LOSS = 1.25, TOTAL EXCESS = 2.18

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.92-HR
+ (CFS)	(HR)					
		(CFS)				
+ 1757.	3.83		335.	84.	81.	81.
		(INCHES)	2.175	2.179	2.179	2.179
		(AC-FT)	166.	166.	166.	166.

CUMULATIVE AREA = 1.43 SQ MI

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HYDROGRAPH AT STATION 5
PLAN 1, RATIO = .90

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DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q		DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q
1		0000	1	.00	.00	.00	0.	*	1		1230	151	.00	.00	.00	0.
1		0005	2	.06	.06	.00	0.	*	1		1235	152	.00	.00	.00	0.
1		0010	3	.11	.11	.00	0.	*	1		1240	153	.00	.00	.00	0.
1		0015	4	.04	.04	.00	0.	*	1		1245	154	.00	.00	.00	0.
1		0020	5	.05	.05	.00	0.	*	1		1250	155	.00	.00	.00	0.
1		0025	6	.06	.06	.00	0.	*	1		1255	156	.00	.00	.00	0.
1		0030	7	.05	.04	.01	2.	*	1		1300	157	.00	.00	.00	0.
1		0035	8	.02	.02	.00	5.	*	1		1305	158	.00	.00	.00	0.
1		0040	9	.00	.00	.00	10.	*	1		1310	159	.00	.00	.00	0.
1		0045	10	.00	.00	.00	14.	*	1		1315	160	.00	.00	.00	0.
1		0050	11	.00	.00	.00	15.	*	1		1320	161	.00	.00	.00	0.
1		0055	12	.00	.00	.00	15.	*	1		1325	162	.00	.00	.00	0.
1		0100	13	.00	.00	.00	12.	*	1		1330	163	.00	.00	.00	0.
1		0105	14	.01	.01	.00	10.	*	1		1335	164	.00	.00	.00	0.
1		0110	15	.02	.02	.00	8.	*	1		1340	165	.00	.00	.00	0.
1		0115	16	.01	.01	.00	8.	*	1		1345	166	.00	.00	.00	0.
1		0120	17	.02	.01	.00	11.	*	1		1350	167	.00	.00	.00	0.
1		0125	18	.03	.02	.01	15.	*	1		1355	168	.00	.00	.00	0.
1		0130	19	.04	.03	.01	22.	*	1		1400	169	.00	.00	.00	0.
1		0135	20	.03	.02	.01	32.	*	1		1405	170	.00	.00	.00	0.
1		0140	21	.03	.02	.01	44.	*	1		1410	171	.00	.00	.00	0.
1		0145	22	.02	.01	.01	56.	*	1		1415	172	.00	.00	.00	0.
1		0150	23	.01	.00	.00	65.	*	1		1420	173	.00	.00	.00	0.
1		0155	24	.00	.00	.00	70.	*	1		1425	174	.00	.00	.00	0.
1		0200	25	.00	.00	.00	67.	*	1		1430	175	.00	.00	.00	0.
1		0205	26	.01	.01	.00	60.	*	1		1435	176	.00	.00	.00	0.
1		0210	27	.03	.02	.01	53.	*	1		1440	177	.00	.00	.00	0.
1		0215	28	.05	.03	.02	51.	*	1		1445	178	.00	.00	.00	0.
1		0220	29	.04	.02	.02	59.	*	1		1450	179	.00	.00	.00	0.
1		0225	30	.02	.01	.01	75.	*	1		1455	180	.00	.00	.00	0.
1		0230	31	.01	.00	.00	92.	*	1		1500	181	.00	.00	.00	0.
1		0235	32	.02	.01	.01	103.	*	1		1505	182	.00	.00	.00	0.
1		0240	33	.04	.02	.02	107.	*	1		1510	183	.00	.00	.00	0.
1		0245	34	.02	.01	.01	109.	*	1		1515	184	.00	.00	.00	0.
1		0250	35	.01	.00	.00	112.	*	1		1520	185	.00	.00	.00	0.
1		0255	36	.01	.00	.00	114.	*	1		1525	186	.00	.00	.00	0.
1		0300	37	.04	.02	.02	113.	*	1		1530	187	.00	.00	.00	0.
1		0305	38	.08	.04	.05	117.	*	1		1535	188	.00	.00	.00	0.
1		0310	39	.09	.04	.05	138.	*	1		1540	189	.00	.00	.00	0.
1		0315	40	.18	.07	.11	192.	*	1		1545	190	.00	.00	.00	0.
1		0320	41	.28	.09	.19	299.	*	1		1550	191	.00	.00	.00	0.
1		0325	42	.28	.07	.21	479.	*	1		1555	192	.00	.00	.00	0.
1		0330	43	.37	.07	.30	750.	*	1		1600	193	.00	.00	.00	0.
1		0335	44	.10	.02	.09	1058.	*	1		1605	194	.00	.00	.00	0.
1		0340	45	.11	.02	.10	1339.	*	1		1610	195	.00	.00	.00	0.
1		0345	46	.10	.01	.08	1503.	*	1		1615	196	.00	.00	.00	0.
1		0350	47	.02	.00	.02	1521.	*	1		1620	197	.00	.00	.00	0.
1		0355	48	.05	.01	.04	1425.	*	1		1625	198	.00	.00	.00	0.
1		0400	49	.05	.01	.04	1256.	*	1		1630	199	.00	.00	.00	0.
1		0405	50	.02	.00	.01	1056.	*	1		1635	200	.00	.00	.00	0.
1		0410	51	.01	.00	.01	879.	*	1		1640	201	.00	.00	.00	0.
1		0415	52	.02	.00	.02	725.	*	1		1645	202	.00	.00	.00	0.
1		0420	53	.02	.00	.02	593.	*	1		1650	203	.00	.00	.00	0.
1		0425	54	.04	.00	.03	492.	*	1		1655	204	.00	.00	.00	0.
1		0430	55	.07	.01	.06	427.	*	1		1700	205	.00	.00	.00	0.
1		0435	56	.05	.01	.04	395.	*	1		1705	206	.00	.00	.00	0.
1		0440	57	.03	.00	.03	394.	*	1		1710	207	.00	.00	.00	0.
1		0445	58	.04	.00	.04	406.	*	1		1715	208	.00	.00	.00	0.
1		0450	59	.06	.01	.05	417.	*	1		1720	209	.00	.00	.00	0.
1		0455	60	.02	.00	.02	423.	*	1		1725	210	.00	.00	.00	0.
1		0500	61	.02	.00	.02	422.	*	1		1730	211	.00	.00	.00	0.
1		0505	62	.01	.00	.01	401.	*	1		1735	212	.00	.00	.00	0.

1	0510	63	.01	.00	.01	363.	*	1	1740	213	.00	.00	.00	0.
1	0515	64	.01	.00	.01	316.	*	1	1745	214	.00	.00	.00	0.
1	0520	65	.00	.00	.00	263.	*	1	1750	215	.00	.00	.00	0.
1	0525	66	.01	.00	.01	212.	*	1	1755	216	.00	.00	.00	0.
1	0530	67	.00	.00	.00	169.	*	1	1800	217	.00	.00	.00	0.
1	0535	68	.00	.00	.00	136.	*	1	1805	218	.00	.00	.00	0.
1	0540	69	.00	.00	.00	110.	*	1	1810	219	.00	.00	.00	0.
1	0545	70	.01	.00	.01	89.	*	1	1815	220	.00	.00	.00	0.
1	0550	71	.00	.00	.00	75.	*	1	1820	221	.00	.00	.00	0.
1	0555	72	.00	.00	.00	65.	*	1	1825	222	.00	.00	.00	0.
1	0600	73	.00	.00	.00	57.	*	1	1830	223	.00	.00	.00	0.
1	0605	74	.00	.00	.00	50.	*	1	1835	224	.00	.00	.00	0.
1	0610	75	.00	.00	.00	43.	*	1	1840	225	.00	.00	.00	0.
1	0615	76	.00	.00	.00	36.	*	1	1845	226	.00	.00	.00	0.
1	0620	77	.00	.00	.00	28.	*	1	1850	227	.00	.00	.00	0.
1	0625	78	.00	.00	.00	22.	*	1	1855	228	.00	.00	.00	0.
1	0630	79	.00	.00	.00	16.	*	1	1900	229	.00	.00	.00	0.
1	0635	80	.00	.00	.00	11.	*	1	1905	230	.00	.00	.00	0.
1	0640	81	.00	.00	.00	8.	*	1	1910	231	.00	.00	.00	0.
1	0645	82	.00	.00	.00	6.	*	1	1915	232	.00	.00	.00	0.
1	0650	83	.00	.00	.00	4.	*	1	1920	233	.00	.00	.00	0.
1	0655	84	.00	.00	.00	3.	*	1	1925	234	.00	.00	.00	0.
1	0700	85	.00	.00	.00	2.	*	1	1930	235	.00	.00	.00	0.
1	0705	86	.00	.00	.00	1.	*	1	1935	236	.00	.00	.00	0.
1	0710	87	.00	.00	.00	1.	*	1	1940	237	.00	.00	.00	0.
1	0715	88	.00	.00	.00	1.	*	1	1945	238	.00	.00	.00	0.
1	0720	89	.00	.00	.00	0.	*	1	1950	239	.00	.00	.00	0.
1	0725	90	.00	.00	.00	0.	*	1	1955	240	.00	.00	.00	0.
1	0730	91	.00	.00	.00	0.	*	1	2000	241	.00	.00	.00	0.
1	0735	92	.00	.00	.00	0.	*	1	2005	242	.00	.00	.00	0.
1	0740	93	.00	.00	.00	0.	*	1	2010	243	.00	.00	.00	0.
1	0745	94	.00	.00	.00	0.	*	1	2015	244	.00	.00	.00	0.
1	0750	95	.00	.00	.00	0.	*	1	2020	245	.00	.00	.00	0.
1	0755	96	.00	.00	.00	0.	*	1	2025	246	.00	.00	.00	0.
1	0800	97	.00	.00	.00	0.	*	1	2030	247	.00	.00	.00	0.
1	0805	98	.00	.00	.00	0.	*	1	2035	248	.00	.00	.00	0.
1	0810	99	.00	.00	.00	0.	*	1	2040	249	.00	.00	.00	0.
1	0815	100	.00	.00	.00	0.	*	1	2045	250	.00	.00	.00	0.
1	0820	101	.00	.00	.00	0.	*	1	2050	251	.00	.00	.00	0.
1	0825	102	.00	.00	.00	0.	*	1	2055	252	.00	.00	.00	0.
1	0830	103	.00	.00	.00	0.	*	1	2100	253	.00	.00	.00	0.
1	0835	104	.00	.00	.00	0.	*	1	2105	254	.00	.00	.00	0.
1	0840	105	.00	.00	.00	0.	*	1	2110	255	.00	.00	.00	0.
1	0845	106	.00	.00	.00	0.	*	1	2115	256	.00	.00	.00	0.
1	0850	107	.00	.00	.00	0.	*	1	2120	257	.00	.00	.00	0.
1	0855	108	.00	.00	.00	0.	*	1	2125	258	.00	.00	.00	0.
1	0900	109	.00	.00	.00	0.	*	1	2130	259	.00	.00	.00	0.
1	0905	110	.00	.00	.00	0.	*	1	2135	260	.00	.00	.00	0.
1	0910	111	.00	.00	.00	0.	*	1	2140	261	.00	.00	.00	0.
1	0915	112	.00	.00	.00	0.	*	1	2145	262	.00	.00	.00	0.
1	0920	113	.00	.00	.00	0.	*	1	2150	263	.00	.00	.00	0.
1	0925	114	.00	.00	.00	0.	*	1	2155	264	.00	.00	.00	0.
1	0930	115	.00	.00	.00	0.	*	1	2200	265	.00	.00	.00	0.
1	0935	116	.00	.00	.00	0.	*	1	2205	266	.00	.00	.00	0.
1	0940	117	.00	.00	.00	0.	*	1	2210	267	.00	.00	.00	0.
1	0945	118	.00	.00	.00	0.	*	1	2215	268	.00	.00	.00	0.
1	0950	119	.00	.00	.00	0.	*	1	2220	269	.00	.00	.00	0.
1	0955	120	.00	.00	.00	0.	*	1	2225	270	.00	.00	.00	0.
1	1000	121	.00	.00	.00	0.	*	1	2230	271	.00	.00	.00	0.
1	1005	122	.00	.00	.00	0.	*	1	2235	272	.00	.00	.00	0.
1	1010	123	.00	.00	.00	0.	*	1	2240	273	.00	.00	.00	0.
1	1015	124	.00	.00	.00	0.	*	1	2245	274	.00	.00	.00	0.
1	1020	125	.00	.00	.00	0.	*	1	2250	275	.00	.00	.00	0.
1	1025	126	.00	.00	.00	0.	*	1	2255	276	.00	.00	.00	0.
1	1030	127	.00	.00	.00	0.	*	1	2300	277	.00	.00	.00	0.
1	1035	128	.00	.00	.00	0.	*	1	2305	278	.00	.00	.00	0.
1	1040	129	.00	.00	.00	0.	*	1	2310	279	.00	.00	.00	0.
1	1045	130	.00	.00	.00	0.	*	1	2315	280	.00	.00	.00	0.
1	1050	131	.00	.00	.00	0.	*	1	2320	281	.00	.00	.00	0.
1	1055	132	.00	.00	.00	0.	*	1	2325	282	.00	.00	.00	0.
1	1100	133	.00	.00	.00	0.	*	1	2330	283	.00	.00	.00	0.
1	1105	134	.00	.00	.00	0.	*	1	2335	284	.00	.00	.00	0.
1	1110	135	.00	.00	.00	0.	*	1	2340	285	.00	.00	.00	0.
1	1115	136	.00	.00	.00	0.	*	1	2345	286	.00	.00	.00	0.
1	1120	137	.00	.00	.00	0.	*	1	2350	287	.00	.00	.00	0.
1	1125	138	.00	.00	.00	0.	*	1	2355	288	.00	.00	.00	0.
1	1130	139	.00	.00	.00	0.	*	2	0000	289	.00	.00	.00	0.
1	1135	140	.00	.00	.00	0.	*	2	0005	290	.00	.00	.00	0.
1	1140	141	.00	.00	.00	0.	*	2	0010	291	.00	.00	.00	0.
1	1145	142	.00	.00	.00	0.	*	2	0015	292	.00	.00	.00	0.
1	1150	143	.00	.00	.00	0.	*	2	0020	293	.00	.00	.00	0.
1	1155	144	.00	.00	.00	0.	*	2	0025	294	.00	.00	.00	0.
1	1200	145	.00	.00	.00	0.	*	2	0030	295	.00	.00	.00	0.
1	1205	146	.00	.00	.00	0.	*	2	0035	296	.00	.00	.00	0.
1	1210	147	.00	.00	.00	0.	*	2	0040	297	.00	.00	.00	0.
1	1215	148	.00	.00	.00	0.	*	2	0045	298	.00	.00	.00	0.
1	1220	149	.00	.00	.00	0.	*	2	0050	299	.00	.00	.00	0.
1	1225	150	.00	.00	.00	0.	*	2	0055	300	.00	.00	.00	0.

*

TOTAL RAINFALL = 3.09, TOTAL LOSS = 1.22, TOTAL EXCESS = 1.87

PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW			
		6-HR	24-HR	72-HR	24.92-HR
+ (CFS)	(HR)	(CFS)			

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+    1521.      3.83                    287.         72.         69.         69.
                            (INCHES)     1.868       1.871       1.871       1.871
                            (AC-FT)      1.42.        143.        143.        143.

                            CUMULATIVE AREA =     1.43 SQ MI

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1	0245	34	.03	.01	.01	24.	*	1	1515	184	.00	.00	.00	0.
1	0250	35	.01	.01	.01	19.	*	1	1520	185	.00	.00	.00	0.
1	0255	36	.01	.00	.00	12.	*	1	1525	186	.00	.00	.00	0.
1	0300	37	.04	.02	.02	15.	*	1	1530	187	.00	.00	.00	0.
1	0305	38	.09	.04	.05	38.	*	1	1535	188	.00	.00	.00	0.
1	0310	39	.10	.04	.06	65.	*	1	1540	189	.00	.00	.00	0.
1	0315	40	.20	.07	.12	109.	*	1	1545	190	.00	.00	.00	0.
1	0320	41	.31	.10	.21	195.	*	1	1550	191	.00	.00	.00	0.
1	0325	42	.31	.08	.23	283.	*	1	1555	192	.00	.00	.00	0.
1	0330	43	.41	.08	.33	372.	*	1	1600	193	.00	.00	.00	0.
1	0335	44	.12	.02	.10	351.	*	1	1605	194	.00	.00	.00	0.
1	0340	45	.13	.02	.11	239.	*	1	1610	195	.00	.00	.00	0.
1	0345	46	.11	.02	.09	186.	*	1	1615	196	.00	.00	.00	0.
1	0350	47	.02	.00	.02	127.	*	1	1620	197	.00	.00	.00	0.
1	0355	48	.05	.01	.05	82.	*	1	1625	198	.00	.00	.00	0.
1	0400	49	.05	.01	.05	75.	*	1	1630	199	.00	.00	.00	0.
1	0405	50	.02	.00	.01	59.	*	1	1635	200	.00	.00	.00	0.
1	0410	51	.01	.00	.01	36.	*	1	1640	201	.00	.00	.00	0.
1	0415	52	.03	.00	.02	30.	*	1	1645	202	.00	.00	.00	0.
1	0420	53	.03	.00	.02	34.	*	1	1650	203	.00	.00	.00	0.
1	0425	54	.04	.01	.04	41.	*	1	1655	204	.00	.00	.00	0.
1	0430	55	.08	.01	.07	62.	*	1	1700	205	.00	.00	.00	0.
1	0435	56	.05	.01	.05	78.	*	1	1705	206	.00	.00	.00	0.
1	0440	57	.04	.00	.03	70.	*	1	1710	207	.00	.00	.00	0.
1	0445	58	.04	.01	.04	61.	*	1	1715	208	.00	.00	.00	0.
1	0450	59	.07	.01	.06	70.	*	1	1720	209	.00	.00	.00	0.
1	0455	60	.02	.00	.02	65.	*	1	1725	210	.00	.00	.00	0.
1	0500	61	.02	.00	.02	44.	*	1	1730	211	.00	.00	.00	0.
1	0505	62	.01	.00	.01	30.	*	1	1735	212	.00	.00	.00	0.
1	0510	63	.01	.00	.01	19.	*	1	1740	213	.00	.00	.00	0.
1	0515	64	.01	.00	.01	13.	*	1	1745	214	.00	.00	.00	0.
1	0520	65	.00	.00	.00	10.	*	1	1750	215	.00	.00	.00	0.
1	0525	66	.01	.00	.01	9.	*	1	1755	216	.00	.00	.00	0.
1	0530	67	.00	.00	.00	8.	*	1	1800	217	.00	.00	.00	0.
1	0535	68	.00	.00	.00	5.	*	1	1805	218	.00	.00	.00	0.
1	0540	69	.00	.00	.00	5.	*	1	1810	219	.00	.00	.00	0.
1	0545	70	.01	.00	.01	7.	*	1	1815	220	.00	.00	.00	0.
1	0550	71	.00	.00	.00	7.	*	1	1820	221	.00	.00	.00	0.
1	0555	72	.00	.00	.00	4.	*	1	1825	222	.00	.00	.00	0.
1	0600	73	.00	.00	.00	5.	*	1	1830	223	.00	.00	.00	0.
1	0605	74	.00	.00	.00	3.	*	1	1835	224	.00	.00	.00	0.
1	0610	75	.00	.00	.00	1.	*	1	1840	225	.00	.00	.00	0.
1	0615	76	.00	.00	.00	1.	*	1	1845	226	.00	.00	.00	0.
1	0620	77	.00	.00	.00	0.	*	1	1850	227	.00	.00	.00	0.
1	0625	78	.00	.00	.00	0.	*	1	1855	228	.00	.00	.00	0.
1	0630	79	.00	.00	.00	0.	*	1	1900	229	.00	.00	.00	0.
1	0635	80	.00	.00	.00	0.	*	1	1905	230	.00	.00	.00	0.
1	0640	81	.00	.00	.00	0.	*	1	1910	231	.00	.00	.00	0.
1	0645	82	.00	.00	.00	0.	*	1	1915	232	.00	.00	.00	0.
1	0650	83	.00	.00	.00	0.	*	1	1920	233	.00	.00	.00	0.
1	0655	84	.00	.00	.00	0.	*	1	1925	234	.00	.00	.00	0.
1	0700	85	.00	.00	.00	0.	*	1	1930	235	.00	.00	.00	0.
1	0705	86	.00	.00	.00	0.	*	1	1935	236	.00	.00	.00	0.
1	0710	87	.00	.00	.00	0.	*	1	1940	237	.00	.00	.00	0.
1	0715	88	.00	.00	.00	0.	*	1	1945	238	.00	.00	.00	0.
1	0720	89	.00	.00	.00	0.	*	1	1950	239	.00	.00	.00	0.
1	0725	90	.00	.00	.00	0.	*	1	1955	240	.00	.00	.00	0.
1	0730	91	.00	.00	.00	0.	*	1	2000	241	.00	.00	.00	0.
1	0735	92	.00	.00	.00	0.	*	1	2005	242	.00	.00	.00	0.
1	0740	93	.00	.00	.00	0.	*	1	2010	243	.00	.00	.00	0.
1	0745	94	.00	.00	.00	0.	*	1	2015	244	.00	.00	.00	0.
1	0750	95	.00	.00	.00	0.	*	1	2020	245	.00	.00	.00	0.
1	0755	96	.00	.00	.00	0.	*	1	2025	246	.00	.00	.00	0.
1	0800	97	.00	.00	.00	0.	*	1	2030	247	.00	.00	.00	0.
1	0805	98	.00	.00	.00	0.	*	1	2035	248	.00	.00	.00	0.
1	0810	99	.00	.00	.00	0.	*	1	2040	249	.00	.00	.00	0.
1	0815	100	.00	.00	.00	0.	*	1	2045	250	.00	.00	.00	0.
1	0820	101	.00	.00	.00	0.	*	1	2050	251	.00	.00	.00	0.
1	0825	102	.00	.00	.00	0.	*	1	2055	252	.00	.00	.00	0.
1	0830	103	.00	.00	.00	0.	*	1	2100	253	.00	.00	.00	0.
1	0835	104	.00	.00	.00	0.	*	1	2105	254	.00	.00	.00	0.
1	0840	105	.00	.00	.00	0.	*	1	2110	255	.00	.00	.00	0.
1	0845	106	.00	.00	.00	0.	*	1	2115	256	.00	.00	.00	0.
1	0850	107	.00	.00	.00	0.	*	1	2120	257	.00	.00	.00	0.
1	0855	108	.00	.00	.00	0.	*	1	2125	258	.00	.00	.00	0.
1	0900	109	.00	.00	.00	0.	*	1	2130	259	.00	.00	.00	0.
1	0905	110	.00	.00	.00	0.	*	1	2135	260	.00	.00	.00	0.
1	0910	111	.00	.00	.00	0.	*	1	2140	261	.00	.00	.00	0.
1	0915	112	.00	.00	.00	0.	*	1	2145	262	.00	.00	.00	0.
1	0920	113	.00	.00	.00	0.	*	1	2150	263	.00	.00	.00	0.
1	0925	114	.00	.00	.00	0.	*	1	2155	264	.00	.00	.00	0.
1	0930	115	.00	.00	.00	0.	*	1	2200	265	.00	.00	.00	0.
1	0935	116	.00	.00	.00	0.	*	1	2205	266	.00	.00	.00	0.
1	0940	117	.00	.00	.00	0.	*	1	2210	267	.00	.00	.00	0.
1	0945	118	.00	.00	.00	0.	*	1	2215	268	.00	.00	.00	0.
1	0950	119	.00	.00	.00	0.	*	1	2220	269	.00	.00	.00	0.
1	0955	120	.00	.00	.00	0.	*	1	2225	270	.00	.00	.00	0.
1	1000	121	.00	.00	.00	0.	*	1	2230	271	.00	.00	.00	0.
1	1005	122	.00	.00	.00	0.	*	1	2235	272	.00	.00	.00	0.
1	1010	123	.00	.00	.00	0.	*	1	2240	273	.00	.00	.00	0.
1	1015	124	.00	.00	.00	0.	*	1	2245	274	.00	.00	.00	0.
1	1020	125	.00	.00	.00	0.	*	1	2250	275	.00	.00	.00	0.
1	1025	126	.00	.00	.00	0.	*	1	2255	276	.00	.00	.00	0.
1	1030	127	.00	.00	.00	0.	*	1	2300	277	.00	.00	.00	0.
1	1035	128	.00	.00	.00	0.	*	1	2305	278	.00	.00	.00	0.
1	1040	129	.00	.00	.00	0.	*	1	2310	279	.00	.00	.00	0.
1	1045	130	.00	.00	.00	0.	*	1	2315	280	.00	.00	.00	0.
1	1050	131	.00	.00	.00	0.	*	1	2320	281	.00	.00	.00	0.
1	1055	132	.00	.00	.00	0.	*	1	2325	282	.00	.00	.00	0.

1	1100	133	.00	.00	.00	0.	*	1	2330	283	.00	.00	.00	0.
1	1105	134	.00	.00	.00	0.	*	1	2335	284	.00	.00	.00	0.
1	1110	135	.00	.00	.00	0.	*	1	2340	285	.00	.00	.00	0.
1	1115	136	.00	.00	.00	0.	*	1	2345	286	.00	.00	.00	0.
1	1120	137	.00	.00	.00	0.	*	1	2350	287	.00	.00	.00	0.
1	1125	138	.00	.00	.00	0.	*	1	2355	288	.00	.00	.00	0.
1	1130	139	.00	.00	.00	0.	*	2	0000	289	.00	.00	.00	0.
1	1135	140	.00	.00	.00	0.	*	2	0005	290	.00	.00	.00	0.
1	1140	141	.00	.00	.00	0.	*	2	0010	291	.00	.00	.00	0.
1	1145	142	.00	.00	.00	0.	*	2	0015	292	.00	.00	.00	0.
1	1150	143	.00	.00	.00	0.	*	2	0020	293	.00	.00	.00	0.
1	1155	144	.00	.00	.00	0.	*	2	0025	294	.00	.00	.00	0.
1	1200	145	.00	.00	.00	0.	*	2	0030	295	.00	.00	.00	0.
1	1205	146	.00	.00	.00	0.	*	2	0035	296	.00	.00	.00	0.
1	1210	147	.00	.00	.00	0.	*	2	0040	297	.00	.00	.00	0.
1	1215	148	.00	.00	.00	0.	*	2	0045	298	.00	.00	.00	0.
1	1220	149	.00	.00	.00	0.	*	2	0050	299	.00	.00	.00	0.
1	1225	150	.00	.00	.00	0.	*	2	0055	300	.00	.00	.00	0.
							*							

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TOTAL RAINFALL = 3.43, TOTAL LOSS = 1.36, TOTAL EXCESS = 2.07

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.92-HR
+ (CFS)	(HR)					
		(CFS)				
+ 372.	3.50		45.	11.	11.	11.
		(INCHES)	2.069	2.069	2.069	2.069
		(AC-FT)	22.	22.	22.	22.

CUMULATIVE AREA = .20 SQ MI

WARNING *** TIME INTERVAL IS GREATER THAN .29*LAG

****

HYDROGRAPH AT STATION 6
PLAN 1, RATIO = .90

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DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q		DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q
1		0000	1	.00	.00	.00	0.	*	1		1230	151	.00	.00	.00	0.
1		0005	2	.06	.06	.00	0.	*	1		1235	152	.00	.00	.00	0.
1		0010	3	.11	.11	.00	0.	*	1		1240	153	.00	.00	.00	0.
1		0015	4	.04	.04	.00	0.	*	1		1245	154	.00	.00	.00	0.
1		0020	5	.05	.05	.00	0.	*	1		1250	155	.00	.00	.00	0.
1		0025	6	.06	.06	.00	0.	*	1		1255	156	.00	.00	.00	0.
1		0030	7	.05	.05	.00	1.	*	1		1300	157	.00	.00	.00	0.
1		0035	8	.02	.02	.00	2.	*	1		1305	158	.00	.00	.00	0.
1		0040	9	.00	.00	.00	2.	*	1		1310	159	.00	.00	.00	0.
1		0045	10	.00	.00	.00	1.	*	1		1315	160	.00	.00	.00	0.
1		0050	11	.00	.00	.00	0.	*	1		1320	161	.00	.00	.00	0.
1		0055	12	.00	.00	.00	0.	*	1		1325	162	.00	.00	.00	0.
1		0100	13	.00	.00	.00	0.	*	1		1330	163	.00	.00	.00	0.
1		0105	14	.01	.01	.00	0.	*	1		1335	164	.00	.00	.00	0.
1		0110	15	.02	.02	.00	2.	*	1		1340	165	.00	.00	.00	0.
1		0115	16	.01	.01	.00	2.	*	1		1345	166	.00	.00	.00	0.
1		0120	17	.02	.02	.00	3.	*	1		1350	167	.00	.00	.00	0.
1		0125	18	.03	.03	.01	5.	*	1		1355	168	.00	.00	.00	0.
1		0130	19	.04	.03	.01	8.	*	1		1400	169	.00	.00	.00	0.
1		0135	20	.03	.02	.01	11.	*	1		1405	170	.00	.00	.00	0.
1		0140	21	.03	.02	.01	11.	*	1		1410	171	.00	.00	.00	0.
1		0145	22	.02	.02	.01	11.	*	1		1415	172	.00	.00	.00	0.
1		0150	23	.01	.00	.00	8.	*	1		1420	173	.00	.00	.00	0.
1		0155	24	.00	.00	.00	5.	*	1		1425	174	.00	.00	.00	0.
1		0200	25	.00	.00	.00	3.	*	1		1430	175	.00	.00	.00	0.
1		0205	26	.01	.01	.00	3.	*	1		1435	176	.00	.00	.00	0.
1		0210	27	.03	.02	.01	7.	*	1		1440	177	.00	.00	.00	0.
1		0215	28	.05	.03	.02	14.	*	1		1445	178	.00	.00	.00	0.
1		0220	29	.04	.02	.01	20.	*	1		1450	179	.00	.00	.00	0.
1		0225	30	.02	.02	.01	19.	*	1		1455	180	.00	.00	.00	0.
1		0230	31	.01	.00	.00	13.	*	1		1500	181	.00	.00	.00	0.
1		0235	32	.02	.01	.01	9.	*	1		1505	182	.00	.00	.00	0.
1		0240	33	.04	.02	.02	15.	*	1		1510	183	.00	.00	.00	0.
1		0245	34	.02	.01	.01	19.	*	1		1515	184	.00	.00	.00	0.
1		0250	35	.01	.01	.00	15.	*	1		1520	185	.00	.00	.00	0.
1		0255	36	.01	.00	.00	9.	*	1		1525	186	.00	.00	.00	0.
1		0300	37	.04	.02	.02	13.	*	1		1530	187	.00	.00	.00	0.
1		0305	38	.08	.04	.04	31.	*	1		1535	188	.00	.00	.00	0.
1		0310	39	.09	.04	.05	54.	*	1		1540	189	.00	.00	.00	0.
1		0315	40	.18	.07	.10	91.	*	1		1545	190	.00	.00	.00	0.
1		0320	41	.28	.10	.18	165.	*	1		1550	191	.00	.00	.00	0.
1		0325	42	.28	.08	.20	241.	*	1		1555	192	.00	.00	.00	0.
1		0330	43	.37	.09	.28	320.	*	1		1600	193	.00	.00	.00	0.
1		0335	44	.10	.02	.08	303.	*	1		1605	194	.00	.00	.00	0.
1		0340	45	.11	.02	.09	208.	*	1		1610	195	.00	.00	.00	0.
1		0345	46	.10	.02	.08	162.	*	1		1615	196	.00	.00	.00	0.
1		0350	47	.02	.00	.02	111.	*	1		1620	197	.00	.00	.00	0.
1		0355	48	.05	.01	.04	72.	*	1		1625	198	.00	.00	.00	0.

1	0400	49	.05	.01	.04	66.	*	1	1630	199	.00	.00	.00	0.
1	0405	50	.02	.00	.01	52.	*	1	1635	200	.00	.00	.00	0.
1	0410	51	.01	.00	.01	32.	*	1	1640	201	.00	.00	.00	0.
1	0415	52	.02	.00	.02	27.	*	1	1645	202	.00	.00	.00	0.
1	0420	53	.02	.00	.02	30.	*	1	1650	203	.00	.00	.00	0.
1	0425	54	.04	.01	.03	36.	*	1	1655	204	.00	.00	.00	0.
1	0430	55	.07	.01	.06	55.	*	1	1700	205	.00	.00	.00	0.
1	0435	56	.05	.01	.04	68.	*	1	1705	206	.00	.00	.00	0.
1	0440	57	.03	.00	.03	61.	*	1	1710	207	.00	.00	.00	0.
1	0445	58	.04	.01	.03	54.	*	1	1715	208	.00	.00	.00	0.
1	0450	59	.06	.01	.05	62.	*	1	1720	209	.00	.00	.00	0.
1	0455	60	.02	.00	.02	57.	*	1	1725	210	.00	.00	.00	0.
1	0500	61	.02	.00	.02	39.	*	1	1730	211	.00	.00	.00	0.
1	0505	62	.01	.00	.01	27.	*	1	1735	212	.00	.00	.00	0.
1	0510	63	.01	.00	.01	17.	*	1	1740	213	.00	.00	.00	0.
1	0515	64	.01	.00	.01	12.	*	1	1745	214	.00	.00	.00	0.
1	0520	65	.00	.00	.00	8.	*	1	1750	215	.00	.00	.00	0.
1	0525	66	.01	.00	.01	8.	*	1	1755	216	.00	.00	.00	0.
1	0530	67	.00	.00	.00	7.	*	1	1800	217	.00	.00	.00	0.
1	0535	68	.00	.00	.00	4.	*	1	1805	218	.00	.00	.00	0.
1	0540	69	.00	.00	.00	4.	*	1	1810	219	.00	.00	.00	0.
1	0545	70	.01	.00	.01	6.	*	1	1815	220	.00	.00	.00	0.
1	0550	71	.00	.00	.00	6.	*	1	1820	221	.00	.00	.00	0.
1	0555	72	.00	.00	.00	4.	*	1	1825	222	.00	.00	.00	0.
1	0600	73	.00	.00	.00	4.	*	1	1830	223	.00	.00	.00	0.
1	0605	74	.00	.00	.00	3.	*	1	1835	224	.00	.00	.00	0.
1	0610	75	.00	.00	.00	1.	*	1	1840	225	.00	.00	.00	0.
1	0615	76	.00	.00	.00	0.	*	1	1845	226	.00	.00	.00	0.
1	0620	77	.00	.00	.00	0.	*	1	1850	227	.00	.00	.00	0.
1	0625	78	.00	.00	.00	0.	*	1	1855	228	.00	.00	.00	0.
1	0630	79	.00	.00	.00	0.	*	1	1900	229	.00	.00	.00	0.
1	0635	80	.00	.00	.00	0.	*	1	1905	230	.00	.00	.00	0.
1	0640	81	.00	.00	.00	0.	*	1	1910	231	.00	.00	.00	0.
1	0645	82	.00	.00	.00	0.	*	1	1915	232	.00	.00	.00	0.
1	0650	83	.00	.00	.00	0.	*	1	1920	233	.00	.00	.00	0.
1	0655	84	.00	.00	.00	0.	*	1	1925	234	.00	.00	.00	0.
1	0700	85	.00	.00	.00	0.	*	1	1930	235	.00	.00	.00	0.
1	0705	86	.00	.00	.00	0.	*	1	1935	236	.00	.00	.00	0.
1	0710	87	.00	.00	.00	0.	*	1	1940	237	.00	.00	.00	0.
1	0715	88	.00	.00	.00	0.	*	1	1945	238	.00	.00	.00	0.
1	0720	89	.00	.00	.00	0.	*	1	1950	239	.00	.00	.00	0.
1	0725	90	.00	.00	.00	0.	*	1	1955	240	.00	.00	.00	0.
1	0730	91	.00	.00	.00	0.	*	1	2000	241	.00	.00	.00	0.
1	0735	92	.00	.00	.00	0.	*	1	2005	242	.00	.00	.00	0.
1	0740	93	.00	.00	.00	0.	*	1	2010	243	.00	.00	.00	0.
1	0745	94	.00	.00	.00	0.	*	1	2015	244	.00	.00	.00	0.
1	0750	95	.00	.00	.00	0.	*	1	2020	245	.00	.00	.00	0.
1	0755	96	.00	.00	.00	0.	*	1	2025	246	.00	.00	.00	0.
1	0800	97	.00	.00	.00	0.	*	1	2030	247	.00	.00	.00	0.
1	0805	98	.00	.00	.00	0.	*	1	2035	248	.00	.00	.00	0.
1	0810	99	.00	.00	.00	0.	*	1	2040	249	.00	.00	.00	0.
1	0815	100	.00	.00	.00	0.	*	1	2045	250	.00	.00	.00	0.
1	0820	101	.00	.00	.00	0.	*	1	2050	251	.00	.00	.00	0.
1	0825	102	.00	.00	.00	0.	*	1	2055	252	.00	.00	.00	0.
1	0830	103	.00	.00	.00	0.	*	1	2100	253	.00	.00	.00	0.
1	0835	104	.00	.00	.00	0.	*	1	2105	254	.00	.00	.00	0.
1	0840	105	.00	.00	.00	0.	*	1	2110	255	.00	.00	.00	0.
1	0845	106	.00	.00	.00	0.	*	1	2115	256	.00	.00	.00	0.
1	0850	107	.00	.00	.00	0.	*	1	2120	257	.00	.00	.00	0.
1	0855	108	.00	.00	.00	0.	*	1	2125	258	.00	.00	.00	0.
1	0900	109	.00	.00	.00	0.	*	1	2130	259	.00	.00	.00	0.
1	0905	110	.00	.00	.00	0.	*	1	2135	260	.00	.00	.00	0.
1	0910	111	.00	.00	.00	0.	*	1	2140	261	.00	.00	.00	0.
1	0915	112	.00	.00	.00	0.	*	1	2145	262	.00	.00	.00	0.
1	0920	113	.00	.00	.00	0.	*	1	2150	263	.00	.00	.00	0.
1	0925	114	.00	.00	.00	0.	*	1	2155	264	.00	.00	.00	0.
1	0930	115	.00	.00	.00	0.	*	1	2200	265	.00	.00	.00	0.
1	0935	116	.00	.00	.00	0.	*	1	2205	266	.00	.00	.00	0.
1	0940	117	.00	.00	.00	0.	*	1	2210	267	.00	.00	.00	0.
1	0945	118	.00	.00	.00	0.	*	1	2215	268	.00	.00	.00	0.
1	0950	119	.00	.00	.00	0.	*	1	2220	269	.00	.00	.00	0.
1	0955	120	.00	.00	.00	0.	*	1	2225	270	.00	.00	.00	0.
1	1000	121	.00	.00	.00	0.	*	1	2230	271	.00	.00	.00	0.
1	1005	122	.00	.00	.00	0.	*	1	2235	272	.00	.00	.00	0.
1	1010	123	.00	.00	.00	0.	*	1	2240	273	.00	.00	.00	0.
1	1015	124	.00	.00	.00	0.	*	1	2245	274	.00	.00	.00	0.
1	1020	125	.00	.00	.00	0.	*	1	2250	275	.00	.00	.00	0.
1	1025	126	.00	.00	.00	0.	*	1	2255	276	.00	.00	.00	0.
1	1030	127	.00	.00	.00	0.	*	1	2300	277	.00	.00	.00	0.
1	1035	128	.00	.00	.00	0.	*	1	2305	278	.00	.00	.00	0.
1	1040	129	.00	.00	.00	0.	*	1	2310	279	.00	.00	.00	0.
1	1045	130	.00	.00	.00	0.	*	1	2315	280	.00	.00	.00	0.
1	1050	131	.00	.00	.00	0.	*	1	2320	281	.00	.00	.00	0.
1	1055	132	.00	.00	.00	0.	*	1	2325	282	.00	.00	.00	0.
1	1100	133	.00	.00	.00	0.	*	1	2330	283	.00	.00	.00	0.
1	1105	134	.00	.00	.00	0.	*	1	2335	284	.00	.00	.00	0.
1	1110	135	.00	.00	.00	0.	*	1	2340	285	.00	.00	.00	0.
1	1115	136	.00	.00	.00	0.	*	1	2345	286	.00	.00	.00	0.
1	1120	137	.00	.00	.00	0.	*	1	2350	287	.00	.00	.00	0.
1	1125	138	.00	.00	.00	0.	*	1	2355	288	.00	.00	.00	0.
1	1130	139	.00	.00	.00	0.	*	2	0000	289	.00	.00	.00	0.
1	1135	140	.00	.00	.00	0.	*	2	0005	290	.00	.00	.00	0.
1	1140	141	.00	.00	.00	0.	*	2	0010	291	.00	.00	.00	0.
1	1145	142	.00	.00	.00	0.	*	2	0015	292	.00	.00	.00	0.
1	1150	143	.00	.00	.00	0.	*	2	0020	293	.00	.00	.00	0.
1	1155	144	.00	.00	.00	0.	*	2	0025	294	.00	.00	.00	0.
1	1200	145	.00	.00	.00	0.	*	2	0030	295	.00	.00	.00	0.
1	1205	146	.00	.00	.00	0.	*	2	0035	296	.00	.00	.00	0.
1	1210	147	.00	.00	.00	0.	*	2	0040	297	.00	.00	.00	0.

1	1215	148	.00	.00	.00	0.	*	2	0045	298	.00	.00	.00	0.
1	1220	149	.00	.00	.00	0.	*	2	0050	299	.00	.00	.00	0.
1	1225	150	.00	.00	.00	0.	*	2	0055	300	.00	.00	.00	0.

TOTAL RAINFALL = 3.09, TOTAL LOSS = 1.32, TOTAL EXCESS = 1.77

PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW			
		6-HR	24-HR	72-HR	24.92-HR
(CFS)	(HR)				
		(CFS)			
320.	3.50	38.	10.	9.	9.
		(INCHES) 1.768	1.768	1.768	1.768
		(AC-FT) 19.	19.	19.	19.

CUMULATIVE AREA = .20 SQ MI

53 KK 7

SUBBASIN RUNOFF DATA

54 BA SUBBASIN CHARACTERISTICS
TAREA .74 SUBBASIN AREA

PRECIPITATION DATA

26 PB STORM 3.43 BASIN TOTAL PRECIPITATION

27 PI INCREMENTAL PRECIPITATION PATTERN

.02	.04	.01	.02	.02	.01	.00	.00	.00	
.00	.00	.00	.01	.00	.01	.01	.01	.01	.01
.01	.00	.00	.00	.00	.01	.02	.01	.01	.00
.01	.01	.01	.00	.00	.01	.03	.03	.06	.09
.09	.12	.03	.04	.03	.01	.02	.02	.00	.00
.01	.01	.01	.02	.02	.01	.01	.02	.01	.01
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00								

55 LS SCS LOSS RATE
STRTL .31 INITIAL ABSTRACTION
CRVNBR 86.40 CURVE NUMBER
RTIMP .00 PERCENT IMPERVIOUS AREA

56 UD SCS DIMENSIONLESS UNITGRAPH
TLAG .17 LAG

***

WARNING *** TIME INTERVAL IS GREATER THAN .29*LAG

UNIT HYDROGRAPH
12 END-OF-PERIOD ORDINATES

494.	1510.	1588.	1030.	517.	281.	149.	79.	42.	22.
13.	6.								

HYDROGRAPH AT STATION 7

DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q	DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q
1		0000	1	.00	.00	.00	0.	1		1230	151	.00	.00	.00	0.
1		0005	2	.07	.07	.00	0.	1		1235	152	.00	.00	.00	0.
1		0010	3	.13	.13	.00	0.	1		1240	153	.00	.00	.00	0.
1		0015	4	.04	.04	.00	0.	1		1245	154	.00	.00	.00	0.
1		0020	5	.06	.06	.00	0.	1		1250	155	.00	.00	.00	0.
1		0025	6	.07	.07	.00	1.	1		1255	156	.00	.00	.00	0.
1		0030	7	.05	.05	.01	6.	1		1300	157	.00	.00	.00	0.
1		0035	8	.02	.02	.00	12.	1		1305	158	.00	.00	.00	0.
1		0040	9	.00	.00	.00	15.	1		1310	159	.00	.00	.00	0.
1		0045	10	.00	.00	.00	11.	1		1315	160	.00	.00	.00	0.
1		0050	11	.00	.00	.00	6.	1		1320	161	.00	.00	.00	0.
1		0055	12	.00	.00	.00	3.	1		1325	162	.00	.00	.00	0.
1		0100	13	.00	.00	.00	2.	1		1330	163	.00	.00	.00	0.
1		0105	14	.01	.01	.00	2.	1		1335	164	.00	.00	.00	0.
1		0110	15	.02	.02	.00	5.	1		1340	165	.00	.00	.00	0.
1		0115	16	.01	.01	.00	10.	1		1345	166	.00	.00	.00	0.
1		0120	17	.02	.02	.00	12.	1		1350	167	.00	.00	.00	0.
1		0125	18	.03	.03	.01	17.	1		1355	168	.00	.00	.00	0.

1	0130	19	.05	.04	.01	28.	*	1	1400	169	.00	.00	.00	0.
1	0135	20	.03	.02	.01	41.	*	1	1405	170	.00	.00	.00	0.
1	0140	21	.03	.02	.01	49.	*	1	1410	171	.00	.00	.00	0.
1	0145	22	.02	.02	.01	51.	*	1	1415	172	.00	.00	.00	0.
1	0150	23	.01	.00	.00	47.	*	1	1420	173	.00	.00	.00	0.
1	0155	24	.00	.00	.00	36.	*	1	1425	174	.00	.00	.00	0.
1	0200	25	.00	.00	.00	24.	*	1	1430	175	.00	.00	.00	0.
1	0205	26	.01	.01	.00	17.	*	1	1435	176	.00	.00	.00	0.
1	0210	27	.03	.02	.01	21.	*	1	1440	177	.00	.00	.00	0.
1	0215	28	.05	.03	.02	40.	*	1	1445	178	.00	.00	.00	0.
1	0220	29	.04	.02	.02	65.	*	1	1450	179	.00	.00	.00	0.
1	0225	30	.03	.02	.01	80.	*	1	1455	180	.00	.00	.00	0.
1	0230	31	.01	.00	.00	76.	*	1	1500	181	.00	.00	.00	0.
1	0235	32	.02	.01	.01	60.	*	1	1505	182	.00	.00	.00	0.
1	0240	33	.05	.03	.02	57.	*	1	1510	183	.00	.00	.00	0.
1	0245	34	.03	.01	.01	71.	*	1	1515	184	.00	.00	.00	0.
1	0250	35	.01	.01	.01	76.	*	1	1520	185	.00	.00	.00	0.
1	0255	36	.01	.00	.00	63.	*	1	1525	186	.00	.00	.00	0.
1	0300	37	.04	.02	.02	54.	*	1	1530	187	.00	.00	.00	0.
1	0305	38	.09	.04	.05	83.	*	1	1535	188	.00	.00	.00	0.
1	0310	39	.10	.04	.06	153.	*	1	1540	189	.00	.00	.00	0.
1	0315	40	.20	.07	.12	258.	*	1	1545	190	.00	.00	.00	0.
1	0320	41	.31	.10	.21	449.	*	1	1550	191	.00	.00	.00	0.
1	0325	42	.31	.08	.23	723.	*	1	1555	192	.00	.00	.00	0.
1	0330	43	.41	.08	.33	1024.	*	1	1600	193	.00	.00	.00	0.
1	0335	44	.12	.02	.10	1219.	*	1	1605	194	.00	.00	.00	0.
1	0340	45	.13	.02	.11	1115.	*	1	1610	195	.00	.00	.00	0.
1	0345	46	.11	.02	.09	900.	*	1	1615	196	.00	.00	.00	0.
1	0350	47	.02	.00	.02	693.	*	1	1620	197	.00	.00	.00	0.
1	0355	48	.05	.01	.05	506.	*	1	1625	198	.00	.00	.00	0.
1	0400	49	.05	.01	.05	380.	*	1	1630	199	.00	.00	.00	0.
1	0405	50	.02	.00	.01	306.	*	1	1635	200	.00	.00	.00	0.
1	0410	51	.01	.00	.01	232.	*	1	1640	201	.00	.00	.00	0.
1	0415	52	.03	.00	.02	168.	*	1	1645	202	.00	.00	.00	0.
1	0420	53	.03	.00	.02	141.	*	1	1650	203	.00	.00	.00	0.
1	0425	54	.04	.01	.04	142.	*	1	1655	204	.00	.00	.00	0.
1	0430	55	.08	.01	.07	174.	*	1	1700	205	.00	.00	.00	0.
1	0435	56	.05	.01	.05	229.	*	1	1705	206	.00	.00	.00	0.
1	0440	57	.04	.00	.03	255.	*	1	1710	207	.00	.00	.00	0.
1	0445	58	.04	.01	.04	245.	*	1	1715	208	.00	.00	.00	0.
1	0450	59	.07	.01	.06	242.	*	1	1720	209	.00	.00	.00	0.
1	0455	60	.02	.00	.02	248.	*	1	1725	210	.00	.00	.00	0.
1	0500	61	.02	.00	.02	217.	*	1	1730	211	.00	.00	.00	0.
1	0505	62	.01	.00	.01	167.	*	1	1735	212	.00	.00	.00	0.
1	0510	63	.01	.00	.01	119.	*	1	1740	213	.00	.00	.00	0.
1	0515	64	.01	.00	.01	84.	*	1	1745	214	.00	.00	.00	0.
1	0520	65	.00	.00	.00	60.	*	1	1750	215	.00	.00	.00	0.
1	0525	66	.01	.00	.01	46.	*	1	1755	216	.00	.00	.00	0.
1	0530	67	.00	.00	.00	39.	*	1	1800	217	.00	.00	.00	0.
1	0535	68	.00	.00	.00	30.	*	1	1805	218	.00	.00	.00	0.
1	0540	69	.00	.00	.00	23.	*	1	1810	219	.00	.00	.00	0.
1	0545	70	.01	.00	.01	22.	*	1	1815	220	.00	.00	.00	0.
1	0550	71	.00	.00	.00	26.	*	1	1820	221	.00	.00	.00	0.
1	0555	72	.00	.00	.00	23.	*	1	1825	222	.00	.00	.00	0.
1	0600	73	.00	.00	.00	19.	*	1	1830	223	.00	.00	.00	0.
1	0605	74	.00	.00	.00	16.	*	1	1835	224	.00	.00	.00	0.
1	0610	75	.00	.00	.00	12.	*	1	1840	225	.00	.00	.00	0.
1	0615	76	.00	.00	.00	7.	*	1	1845	226	.00	.00	.00	0.
1	0620	77	.00	.00	.00	3.	*	1	1850	227	.00	.00	.00	0.
1	0625	78	.00	.00	.00	2.	*	1	1855	228	.00	.00	.00	0.
1	0630	79	.00	.00	.00	1.	*	1	1900	229	.00	.00	.00	0.
1	0635	80	.00	.00	.00	1.	*	1	1905	230	.00	.00	.00	0.
1	0640	81	.00	.00	.00	0.	*	1	1910	231	.00	.00	.00	0.
1	0645	82	.00	.00	.00	0.	*	1	1915	232	.00	.00	.00	0.
1	0650	83	.00	.00	.00	0.	*	1	1920	233	.00	.00	.00	0.
1	0655	84	.00	.00	.00	0.	*	1	1925	234	.00	.00	.00	0.
1	0700	85	.00	.00	.00	0.	*	1	1930	235	.00	.00	.00	0.
1	0705	86	.00	.00	.00	0.	*	1	1935	236	.00	.00	.00	0.
1	0710	87	.00	.00	.00	0.	*	1	1940	237	.00	.00	.00	0.
1	0715	88	.00	.00	.00	0.	*	1	1945	238	.00	.00	.00	0.
1	0720	89	.00	.00	.00	0.	*	1	1950	239	.00	.00	.00	0.
1	0725	90	.00	.00	.00	0.	*	1	1955	240	.00	.00	.00	0.
1	0730	91	.00	.00	.00	0.	*	1	2000	241	.00	.00	.00	0.
1	0735	92	.00	.00	.00	0.	*	1	2005	242	.00	.00	.00	0.
1	0740	93	.00	.00	.00	0.	*	1	2010	243	.00	.00	.00	0.
1	0745	94	.00	.00	.00	0.	*	1	2015	244	.00	.00	.00	0.
1	0750	95	.00	.00	.00	0.	*	1	2020	245	.00	.00	.00	0.
1	0755	96	.00	.00	.00	0.	*	1	2025	246	.00	.00	.00	0.
1	0800	97	.00	.00	.00	0.	*	1	2030	247	.00	.00	.00	0.
1	0805	98	.00	.00	.00	0.	*	1	2035	248	.00	.00	.00	0.
1	0810	99	.00	.00	.00	0.	*	1	2040	249	.00	.00	.00	0.
1	0815	100	.00	.00	.00	0.	*	1	2045	250	.00	.00	.00	0.
1	0820	101	.00	.00	.00	0.	*	1	2050	251	.00	.00	.00	0.
1	0825	102	.00	.00	.00	0.	*	1	2055	252	.00	.00	.00	0.
1	0830	103	.00	.00	.00	0.	*	1	2100	253	.00	.00	.00	0.
1	0835	104	.00	.00	.00	0.	*	1	2105	254	.00	.00	.00	0.
1	0840	105	.00	.00	.00	0.	*	1	2110	255	.00	.00	.00	0.
1	0845	106	.00	.00	.00	0.	*	1	2115	256	.00	.00	.00	0.
1	0850	107	.00	.00	.00	0.	*	1	2120	257	.00	.00	.00	0.
1	0855	108	.00	.00	.00	0.	*	1	2125	258	.00	.00	.00	0.
1	0900	109	.00	.00	.00	0.	*	1	2130	259	.00	.00	.00	0.
1	0905	110	.00	.00	.00	0.	*	1	2135	260	.00	.00	.00	0.
1	0910	111	.00	.00	.00	0.	*	1	2140	261	.00	.00	.00	0.
1	0915	112	.00	.00	.00	0.	*	1	2145	262	.00	.00	.00	0.
1	0920	113	.00	.00	.00	0.	*	1	2150	263	.00	.00	.00	0.
1	0925	114	.00	.00	.00	0.	*	1	2155	264	.00	.00	.00	0.
1	0930	115	.00	.00	.00	0.	*	1	2200	265	.00	.00	.00	0.
1	0935	116	.00	.00	.00	0.	*	1	2205	266	.00	.00	.00	0.
1	0940	117	.00	.00	.00	0.	*	1	2210	267	.00	.00	.00	0.

1	0945	118	.00	.00	.00	0.	*	1	2215	268	.00	.00	.00	0.
1	0950	119	.00	.00	.00	0.	*	1	2220	269	.00	.00	.00	0.
1	0955	120	.00	.00	.00	0.	*	1	2225	270	.00	.00	.00	0.
1	1000	121	.00	.00	.00	0.	*	1	2230	271	.00	.00	.00	0.
1	1005	122	.00	.00	.00	0.	*	1	2235	272	.00	.00	.00	0.
1	1010	123	.00	.00	.00	0.	*	1	2240	273	.00	.00	.00	0.
1	1015	124	.00	.00	.00	0.	*	1	2245	274	.00	.00	.00	0.
1	1020	125	.00	.00	.00	0.	*	1	2250	275	.00	.00	.00	0.
1	1025	126	.00	.00	.00	0.	*	1	2255	276	.00	.00	.00	0.
1	1030	127	.00	.00	.00	0.	*	1	2300	277	.00	.00	.00	0.
1	1035	128	.00	.00	.00	0.	*	1	2305	278	.00	.00	.00	0.
1	1040	129	.00	.00	.00	0.	*	1	2310	279	.00	.00	.00	0.
1	1045	130	.00	.00	.00	0.	*	1	2315	280	.00	.00	.00	0.
1	1050	131	.00	.00	.00	0.	*	1	2320	281	.00	.00	.00	0.
1	1055	132	.00	.00	.00	0.	*	1	2325	282	.00	.00	.00	0.
1	1100	133	.00	.00	.00	0.	*	1	2330	283	.00	.00	.00	0.
1	1105	134	.00	.00	.00	0.	*	1	2335	284	.00	.00	.00	0.
1	1110	135	.00	.00	.00	0.	*	1	2340	285	.00	.00	.00	0.
1	1115	136	.00	.00	.00	0.	*	1	2345	286	.00	.00	.00	0.
1	1120	137	.00	.00	.00	0.	*	1	2350	287	.00	.00	.00	0.
1	1125	138	.00	.00	.00	0.	*	1	2355	288	.00	.00	.00	0.
1	1130	139	.00	.00	.00	0.	*	2	0000	289	.00	.00	.00	0.
1	1135	140	.00	.00	.00	0.	*	2	0005	290	.00	.00	.00	0.
1	1140	141	.00	.00	.00	0.	*	2	0010	291	.00	.00	.00	0.
1	1145	142	.00	.00	.00	0.	*	2	0015	292	.00	.00	.00	0.
1	1150	143	.00	.00	.00	0.	*	2	0020	293	.00	.00	.00	0.
1	1155	144	.00	.00	.00	0.	*	2	0025	294	.00	.00	.00	0.
1	1200	145	.00	.00	.00	0.	*	2	0030	295	.00	.00	.00	0.
1	1205	146	.00	.00	.00	0.	*	2	0035	296	.00	.00	.00	0.
1	1210	147	.00	.00	.00	0.	*	2	0040	297	.00	.00	.00	0.
1	1215	148	.00	.00	.00	0.	*	2	0045	298	.00	.00	.00	0.
1	1220	149	.00	.00	.00	0.	*	2	0050	299	.00	.00	.00	0.
1	1225	150	.00	.00	.00	0.	*	2	0055	300	.00	.00	.00	0.
							*							

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TOTAL RAINFALL = 3.43, TOTAL LOSS = 1.36, TOTAL EXCESS = 2.07

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.92-HR
+ (CFS)	(HR)					
		(CFS)				
+ 1219.	3.58		165.	41.	40.	40.
		(INCHES)	2.069	2.069	2.069	2.069
		(AC-FT)	82.	82.	82.	82.

CUMULATIVE AREA = .74 SQ MI

WARNING *** TIME INTERVAL IS GREATER THAN .29*LAG

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HYDROGRAPH AT STATION 7
PLAN 1, RATIO = .90

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DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q	*	DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q
								*								
1		0000	1	.00	.00	.00	0.	*	1		1230	151	.00	.00	.00	0.
1		0005	2	.06	.06	.00	0.	*	1		1235	152	.00	.00	.00	0.
1		0010	3	.11	.11	.00	0.	*	1		1240	153	.00	.00	.00	0.
1		0015	4	.04	.04	.00	0.	*	1		1245	154	.00	.00	.00	0.
1		0020	5	.05	.05	.00	0.	*	1		1250	155	.00	.00	.00	0.
1		0025	6	.06	.06	.00	0.	*	1		1255	156	.00	.00	.00	0.
1		0030	7	.05	.05	.00	2.	*	1		1300	157	.00	.00	.00	0.
1		0035	8	.02	.02	.00	5.	*	1		1305	158	.00	.00	.00	0.
1		0040	9	.00	.00	.00	7.	*	1		1310	159	.00	.00	.00	0.
1		0045	10	.00	.00	.00	5.	*	1		1315	160	.00	.00	.00	0.
1		0050	11	.00	.00	.00	3.	*	1		1320	161	.00	.00	.00	0.
1		0055	12	.00	.00	.00	2.	*	1		1325	162	.00	.00	.00	0.
1		0100	13	.00	.00	.00	1.	*	1		1330	163	.00	.00	.00	0.
1		0105	14	.01	.01	.00	1.	*	1		1335	164	.00	.00	.00	0.
1		0110	15	.02	.02	.00	3.	*	1		1340	165	.00	.00	.00	0.
1		0115	16	.01	.01	.00	6.	*	1		1345	166	.00	.00	.00	0.
1		0120	17	.02	.02	.00	8.	*	1		1350	167	.00	.00	.00	0.
1		0125	18	.03	.03	.01	11.	*	1		1355	168	.00	.00	.00	0.
1		0130	19	.04	.03	.01	19.	*	1		1400	169	.00	.00	.00	0.
1		0135	20	.03	.02	.01	30.	*	1		1405	170	.00	.00	.00	0.
1		0140	21	.03	.02	.01	36.	*	1		1410	171	.00	.00	.00	0.
1		0145	22	.02	.02	.01	38.	*	1		1415	172	.00	.00	.00	0.
1		0150	23	.01	.00	.00	35.	*	1		1420	173	.00	.00	.00	0.
1		0155	24	.00	.00	.00	27.	*	1		1425	174	.00	.00	.00	0.
1		0200	25	.00	.00	.00	19.	*	1		1430	175	.00	.00	.00	0.
1		0205	26	.01	.01	.00	13.	*	1		1435	176	.00	.00	.00	0.
1		0210	27	.03	.02	.01	16.	*	1		1440	177	.00	.00	.00	0.
1		0215	28	.05	.03	.02	31.	*	1		1445	178	.00	.00	.00	0.
1		0220	29	.04	.02	.01	51.	*	1		1450	179	.00	.00	.00	0.
1		0225	30	.02	.02	.01	63.	*	1		1455	180	.00	.00	.00	0.
1		0230	31	.01	.00	.00	60.	*	1		1500	181	.00	.00	.00	0.
1		0235	32	.02	.01	.01	48.	*	1		1505	182	.00	.00	.00	0.
1		0240	33	.04	.02	.02	46.	*	1		1510	183	.00	.00	.00	0.

1	0245	34	.02	.01	.01	58.	*	1	1515	184	.00	.00	.00	0.
1	0250	35	.01	.01	.00	62.	*	1	1520	185	.00	.00	.00	0.
1	0255	36	.01	.00	.00	51.	*	1	1525	186	.00	.00	.00	0.
1	0300	37	.04	.02	.02	44.	*	1	1530	187	.00	.00	.00	0.
1	0305	38	.08	.04	.04	68.	*	1	1535	188	.00	.00	.00	0.
1	0310	39	.09	.04	.05	126.	*	1	1540	189	.00	.00	.00	0.
1	0315	40	.18	.07	.10	214.	*	1	1545	190	.00	.00	.00	0.
1	0320	41	.28	.10	.18	376.	*	1	1550	191	.00	.00	.00	0.
1	0325	42	.28	.08	.20	612.	*	1	1555	192	.00	.00	.00	0.
1	0330	43	.37	.09	.28	875.	*	1	1600	193	.00	.00	.00	0.
1	0335	44	.10	.02	.08	1049.	*	1	1605	194	.00	.00	.00	0.
1	0340	45	.11	.02	.09	963.	*	1	1610	195	.00	.00	.00	0.
1	0345	46	.10	.02	.08	780.	*	1	1615	196	.00	.00	.00	0.
1	0350	47	.02	.00	.02	602.	*	1	1620	197	.00	.00	.00	0.
1	0355	48	.05	.01	.04	440.	*	1	1625	198	.00	.00	.00	0.
1	0400	49	.05	.01	.04	332.	*	1	1630	199	.00	.00	.00	0.
1	0405	50	.02	.00	.01	268.	*	1	1635	200	.00	.00	.00	0.
1	0410	51	.01	.00	.01	203.	*	1	1640	201	.00	.00	.00	0.
1	0415	52	.02	.00	.02	147.	*	1	1645	202	.00	.00	.00	0.
1	0420	53	.02	.00	.02	124.	*	1	1650	203	.00	.00	.00	0.
1	0425	54	.04	.01	.03	124.	*	1	1655	204	.00	.00	.00	0.
1	0430	55	.07	.01	.06	152.	*	1	1700	205	.00	.00	.00	0.
1	0435	56	.05	.01	.04	201.	*	1	1705	206	.00	.00	.00	0.
1	0440	57	.03	.00	.03	224.	*	1	1710	207	.00	.00	.00	0.
1	0445	58	.04	.01	.03	215.	*	1	1715	208	.00	.00	.00	0.
1	0450	59	.06	.01	.05	212.	*	1	1720	209	.00	.00	.00	0.
1	0455	60	.02	.00	.02	218.	*	1	1725	210	.00	.00	.00	0.
1	0500	61	.02	.00	.02	191.	*	1	1730	211	.00	.00	.00	0.
1	0505	62	.01	.00	.01	147.	*	1	1735	212	.00	.00	.00	0.
1	0510	63	.01	.00	.01	105.	*	1	1740	213	.00	.00	.00	0.
1	0515	64	.01	.00	.01	74.	*	1	1745	214	.00	.00	.00	0.
1	0520	65	.00	.00	.00	53.	*	1	1750	215	.00	.00	.00	0.
1	0525	66	.01	.00	.01	40.	*	1	1755	216	.00	.00	.00	0.
1	0530	67	.00	.00	.00	34.	*	1	1800	217	.00	.00	.00	0.
1	0535	68	.00	.00	.00	26.	*	1	1805	218	.00	.00	.00	0.
1	0540	69	.00	.00	.00	20.	*	1	1810	219	.00	.00	.00	0.
1	0545	70	.01	.00	.01	20.	*	1	1815	220	.00	.00	.00	0.
1	0550	71	.00	.00	.00	23.	*	1	1820	221	.00	.00	.00	0.
1	0555	72	.00	.00	.00	20.	*	1	1825	222	.00	.00	.00	0.
1	0600	73	.00	.00	.00	17.	*	1	1830	223	.00	.00	.00	0.
1	0605	74	.00	.00	.00	14.	*	1	1835	224	.00	.00	.00	0.
1	0610	75	.00	.00	.00	10.	*	1	1840	225	.00	.00	.00	0.
1	0615	76	.00	.00	.00	6.	*	1	1845	226	.00	.00	.00	0.
1	0620	77	.00	.00	.00	3.	*	1	1850	227	.00	.00	.00	0.
1	0625	78	.00	.00	.00	2.	*	1	1855	228	.00	.00	.00	0.
1	0630	79	.00	.00	.00	1.	*	1	1900	229	.00	.00	.00	0.
1	0635	80	.00	.00	.00	0.	*	1	1905	230	.00	.00	.00	0.
1	0640	81	.00	.00	.00	0.	*	1	1910	231	.00	.00	.00	0.
1	0645	82	.00	.00	.00	0.	*	1	1915	232	.00	.00	.00	0.
1	0650	83	.00	.00	.00	0.	*	1	1920	233	.00	.00	.00	0.
1	0655	84	.00	.00	.00	0.	*	1	1925	234	.00	.00	.00	0.
1	0700	85	.00	.00	.00	0.	*	1	1930	235	.00	.00	.00	0.
1	0705	86	.00	.00	.00	0.	*	1	1935	236	.00	.00	.00	0.
1	0710	87	.00	.00	.00	0.	*	1	1940	237	.00	.00	.00	0.
1	0715	88	.00	.00	.00	0.	*	1	1945	238	.00	.00	.00	0.
1	0720	89	.00	.00	.00	0.	*	1	1950	239	.00	.00	.00	0.
1	0725	90	.00	.00	.00	0.	*	1	1955	240	.00	.00	.00	0.
1	0730	91	.00	.00	.00	0.	*	1	2000	241	.00	.00	.00	0.
1	0735	92	.00	.00	.00	0.	*	1	2005	242	.00	.00	.00	0.
1	0740	93	.00	.00	.00	0.	*	1	2010	243	.00	.00	.00	0.
1	0745	94	.00	.00	.00	0.	*	1	2015	244	.00	.00	.00	0.
1	0750	95	.00	.00	.00	0.	*	1	2020	245	.00	.00	.00	0.
1	0755	96	.00	.00	.00	0.	*	1	2025	246	.00	.00	.00	0.
1	0800	97	.00	.00	.00	0.	*	1	2030	247	.00	.00	.00	0.
1	0805	98	.00	.00	.00	0.	*	1	2035	248	.00	.00	.00	0.
1	0810	99	.00	.00	.00	0.	*	1	2040	249	.00	.00	.00	0.
1	0815	100	.00	.00	.00	0.	*	1	2045	250	.00	.00	.00	0.
1	0820	101	.00	.00	.00	0.	*	1	2050	251	.00	.00	.00	0.
1	0825	102	.00	.00	.00	0.	*	1	2055	252	.00	.00	.00	0.
1	0830	103	.00	.00	.00	0.	*	1	2100	253	.00	.00	.00	0.
1	0835	104	.00	.00	.00	0.	*	1	2105	254	.00	.00	.00	0.
1	0840	105	.00	.00	.00	0.	*	1	2110	255	.00	.00	.00	0.
1	0845	106	.00	.00	.00	0.	*	1	2115	256	.00	.00	.00	0.
1	0850	107	.00	.00	.00	0.	*	1	2120	257	.00	.00	.00	0.
1	0855	108	.00	.00	.00	0.	*	1	2125	258	.00	.00	.00	0.
1	0900	109	.00	.00	.00	0.	*	1	2130	259	.00	.00	.00	0.
1	0905	110	.00	.00	.00	0.	*	1	2135	260	.00	.00	.00	0.
1	0910	111	.00	.00	.00	0.	*	1	2140	261	.00	.00	.00	0.
1	0915	112	.00	.00	.00	0.	*	1	2145	262	.00	.00	.00	0.
1	0920	113	.00	.00	.00	0.	*	1	2150	263	.00	.00	.00	0.
1	0925	114	.00	.00	.00	0.	*	1	2155	264	.00	.00	.00	0.
1	0930	115	.00	.00	.00	0.	*	1	2200	265	.00	.00	.00	0.
1	0935	116	.00	.00	.00	0.	*	1	2205	266	.00	.00	.00	0.
1	0940	117	.00	.00	.00	0.	*	1	2210	267	.00	.00	.00	0.
1	0945	118	.00	.00	.00	0.	*	1	2215	268	.00	.00	.00	0.
1	0950	119	.00	.00	.00	0.	*	1	2220	269	.00	.00	.00	0.
1	0955	120	.00	.00	.00	0.	*	1	2225	270	.00	.00	.00	0.
1	1000	121	.00	.00	.00	0.	*	1	2230	271	.00	.00	.00	0.
1	1005	122	.00	.00	.00	0.	*	1	2235	272	.00	.00	.00	0.
1	1010	123	.00	.00	.00	0.	*	1	2240	273	.00	.00	.00	0.
1	1015	124	.00	.00	.00	0.	*	1	2245	274	.00	.00	.00	0.
1	1020	125	.00	.00	.00	0.	*	1	2250	275	.00	.00	.00	0.
1	1025	126	.00	.00	.00	0.	*	1	2255	276	.00	.00	.00	0.
1	1030	127	.00	.00	.00	0.	*	1	2300	277	.00	.00	.00	0.
1	1035	128	.00	.00	.00	0.	*	1	2305	278	.00	.00	.00	0.
1	1040	129	.00	.00	.00	0.	*	1	2310	279	.00	.00	.00	0.
1	1045	130	.00	.00	.00	0.	*	1	2315	280	.00	.00	.00	0.
1	1050	131	.00	.00	.00	0.	*	1	2320	281	.00	.00	.00	0.
1	1055	132	.00	.00	.00	0.	*	1	2325	282	.00	.00	.00	0.

DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q		DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q
1		1100	133	.00	.00	.00	0.	*	1		2330	283	.00	.00	.00	0.
1		1105	134	.00	.00	.00	0.	*	1		2335	284	.00	.00	.00	0.
1		1110	135	.00	.00	.00	0.	*	1		2340	285	.00	.00	.00	0.
1		1115	136	.00	.00	.00	0.	*	1		2345	286	.00	.00	.00	0.
1		1120	137	.00	.00	.00	0.	*	1		2350	287	.00	.00	.00	0.
1		1125	138	.00	.00	.00	0.	*	1		2355	288	.00	.00	.00	0.
1		1130	139	.00	.00	.00	0.	*	2		0000	289	.00	.00	.00	0.
1		1135	140	.00	.00	.00	0.	*	2		0005	290	.00	.00	.00	0.
1		1140	141	.00	.00	.00	0.	*	2		0010	291	.00	.00	.00	0.
1		1145	142	.00	.00	.00	0.	*	2		0015	292	.00	.00	.00	0.
1		1150	143	.00	.00	.00	0.	*	2		0020	293	.00	.00	.00	0.
1		1155	144	.00	.00	.00	0.	*	2		0025	294	.00	.00	.00	0.
1		1200	145	.00	.00	.00	0.	*	2		0030	295	.00	.00	.00	0.
1		1205	146	.00	.00	.00	0.	*	2		0035	296	.00	.00	.00	0.
1		1210	147	.00	.00	.00	0.	*	2		0040	297	.00	.00	.00	0.
1		1215	148	.00	.00	.00	0.	*	2		0045	298	.00	.00	.00	0.
1		1220	149	.00	.00	.00	0.	*	2		0050	299	.00	.00	.00	0.
1		1225	150	.00	.00	.00	0.	*	2		0055	300	.00	.00	.00	0.

TOTAL RAINFALL = 3.09, TOTAL LOSS = 1.32, TOTAL EXCESS = 1.77

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.92-HR
(CFS)	(HR)					
		(CFS)				
1049.	3.58		141.	35.	34.	34.
		(INCHES)	1.768	1.768	1.768	1.768
		(AC-FT)	70.	70.	70.	70.

CUMULATIVE AREA = .74 SQ MI

57 KK 8

SUBBASIN RUNOFF DATA

58 BA SUBBASIN CHARACTERISTICS
TAREA .19 SUBBASIN AREA

PRECIPITATION DATA

26 PB STORM 3.43 BASIN TOTAL PRECIPITATION

27 PI INCREMENTAL PRECIPITATION PATTERN

.02	.04	.01	.02	.02	.02	.01	.00	.00	.00
.00	.00	.00	.01	.00	.01	.01	.01	.01	.01
.01	.00	.00	.00	.00	.01	.02	.01	.01	.00
.01	.01	.01	.00	.00	.01	.03	.03	.06	.09
.09	.12	.03	.04	.03	.01	.02	.02	.00	.00
.01	.01	.01	.02	.02	.01	.01	.02	.01	.01
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00								

59 LS SCS LOSS RATE
STRTL .30 INITIAL ABSTRACTION
CRVNBR 86.80 CURVE NUMBER
RTIMP .00 PERCENT IMPERVIOUS AREA

60 UD SCS DIMENSIONLESS UNITGRAPH
TLAG .10 LAG

***

WARNING *** TIME INTERVAL IS GREATER THAN .29*LAG

UNIT HYDROGRAPH
8 END-OF-PERIOD ORDINATES

416.	616.	271.	105.	40.	16.	6.	2.

HYDROGRAPH AT STATION 8

DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q		DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q
1		0000	1	.00	.00	.00	0.	*	1		1230	151	.00	.00	.00	0.
1		0005	2	.07	.07	.00	0.	*	1		1235	152	.00	.00	.00	0.
1		0010	3	.13	.13	.00	0.	*	1		1240	153	.00	.00	.00	0.
1		0015	4	.04	.04	.00	0.	*	1		1245	154	.00	.00	.00	0.

1	0020	5	.06	.06	.00	0.	*	1	1250	155	.00	.00	.00	0.
1	0025	6	.07	.07	.00	1.	*	1	1255	156	.00	.00	.00	0.
1	0030	7	.05	.05	.01	4.	*	1	1300	157	.00	.00	.00	0.
1	0035	8	.02	.02	.00	6.	*	1	1305	158	.00	.00	.00	0.
1	0040	9	.00	.00	.00	4.	*	1	1310	159	.00	.00	.00	0.
1	0045	10	.00	.00	.00	2.	*	1	1315	160	.00	.00	.00	0.
1	0050	11	.00	.00	.00	1.	*	1	1320	161	.00	.00	.00	0.
1	0055	12	.00	.00	.00	0.	*	1	1325	162	.00	.00	.00	0.
1	0100	13	.00	.00	.00	0.	*	1	1330	163	.00	.00	.00	0.
1	0105	14	.01	.01	.00	1.	*	1	1335	164	.00	.00	.00	0.
1	0110	15	.02	.02	.00	3.	*	1	1340	165	.00	.00	.00	0.
1	0115	16	.01	.01	.00	4.	*	1	1345	166	.00	.00	.00	0.
1	0120	17	.02	.02	.00	4.	*	1	1350	167	.00	.00	.00	0.
1	0125	18	.03	.03	.01	7.	*	1	1355	168	.00	.00	.00	0.
1	0130	19	.05	.03	.01	12.	*	1	1400	169	.00	.00	.00	0.
1	0135	20	.03	.02	.01	15.	*	1	1405	170	.00	.00	.00	0.
1	0140	21	.03	.02	.01	15.	*	1	1410	171	.00	.00	.00	0.
1	0145	22	.02	.02	.01	14.	*	1	1415	172	.00	.00	.00	0.
1	0150	23	.01	.00	.00	11.	*	1	1420	173	.00	.00	.00	0.
1	0155	24	.00	.00	.00	6.	*	1	1425	174	.00	.00	.00	0.
1	0200	25	.00	.00	.00	3.	*	1	1430	175	.00	.00	.00	0.
1	0205	26	.01	.01	.00	3.	*	1	1435	176	.00	.00	.00	0.
1	0210	27	.03	.02	.01	9.	*	1	1440	177	.00	.00	.00	0.
1	0215	28	.05	.03	.02	18.	*	1	1445	178	.00	.00	.00	0.
1	0220	29	.04	.02	.02	24.	*	1	1450	179	.00	.00	.00	0.
1	0225	30	.03	.01	.01	23.	*	1	1455	180	.00	.00	.00	0.
1	0230	31	.01	.00	.00	17.	*	1	1500	181	.00	.00	.00	0.
1	0235	32	.02	.01	.01	12.	*	1	1505	182	.00	.00	.00	0.
1	0240	33	.05	.02	.02	18.	*	1	1510	183	.00	.00	.00	0.
1	0245	34	.03	.01	.01	24.	*	1	1515	184	.00	.00	.00	0.
1	0250	35	.01	.01	.01	18.	*	1	1520	185	.00	.00	.00	0.
1	0255	36	.01	.00	.00	11.	*	1	1525	186	.00	.00	.00	0.
1	0300	37	.04	.02	.02	15.	*	1	1530	187	.00	.00	.00	0.
1	0305	38	.09	.04	.05	37.	*	1	1535	188	.00	.00	.00	0.
1	0310	39	.10	.04	.06	64.	*	1	1540	189	.00	.00	.00	0.
1	0315	40	.20	.07	.12	106.	*	1	1545	190	.00	.00	.00	0.
1	0320	41	.31	.09	.22	189.	*	1	1550	191	.00	.00	.00	0.
1	0325	42	.31	.08	.24	273.	*	1	1555	192	.00	.00	.00	0.
1	0330	43	.41	.08	.33	358.	*	1	1600	193	.00	.00	.00	0.
1	0335	44	.12	.02	.10	337.	*	1	1605	194	.00	.00	.00	0.
1	0340	45	.13	.02	.11	230.	*	1	1610	195	.00	.00	.00	0.
1	0345	46	.11	.02	.09	178.	*	1	1615	196	.00	.00	.00	0.
1	0350	47	.02	.00	.02	122.	*	1	1620	197	.00	.00	.00	0.
1	0355	48	.05	.01	.05	79.	*	1	1625	198	.00	.00	.00	0.
1	0400	49	.05	.01	.05	72.	*	1	1630	199	.00	.00	.00	0.
1	0405	50	.02	.00	.01	57.	*	1	1635	200	.00	.00	.00	0.
1	0410	51	.01	.00	.01	35.	*	1	1640	201	.00	.00	.00	0.
1	0415	52	.03	.00	.02	29.	*	1	1645	202	.00	.00	.00	0.
1	0420	53	.03	.00	.02	32.	*	1	1650	203	.00	.00	.00	0.
1	0425	54	.04	.01	.04	39.	*	1	1655	204	.00	.00	.00	0.
1	0430	55	.08	.01	.07	60.	*	1	1700	205	.00	.00	.00	0.
1	0435	56	.05	.01	.05	74.	*	1	1705	206	.00	.00	.00	0.
1	0440	57	.04	.00	.03	67.	*	1	1710	207	.00	.00	.00	0.
1	0445	58	.04	.01	.04	59.	*	1	1715	208	.00	.00	.00	0.
1	0450	59	.07	.01	.06	67.	*	1	1720	209	.00	.00	.00	0.
1	0455	60	.02	.00	.02	62.	*	1	1725	210	.00	.00	.00	0.
1	0500	61	.02	.00	.02	42.	*	1	1730	211	.00	.00	.00	0.
1	0505	62	.01	.00	.01	29.	*	1	1735	212	.00	.00	.00	0.
1	0510	63	.01	.00	.01	18.	*	1	1740	213	.00	.00	.00	0.
1	0515	64	.01	.00	.01	13.	*	1	1745	214	.00	.00	.00	0.
1	0520	65	.00	.00	.00	9.	*	1	1750	215	.00	.00	.00	0.
1	0525	66	.01	.00	.01	9.	*	1	1755	216	.00	.00	.00	0.
1	0530	67	.00	.00	.00	8.	*	1	1800	217	.00	.00	.00	0.
1	0535	68	.00	.00	.00	5.	*	1	1805	218	.00	.00	.00	0.
1	0540	69	.00	.00	.00	4.	*	1	1810	219	.00	.00	.00	0.
1	0545	70	.01	.00	.01	7.	*	1	1815	220	.00	.00	.00	0.
1	0550	71	.00	.00	.00	7.	*	1	1820	221	.00	.00	.00	0.
1	0555	72	.00	.00	.00	4.	*	1	1825	222	.00	.00	.00	0.
1	0600	73	.00	.00	.00	4.	*	1	1830	223	.00	.00	.00	0.
1	0605	74	.00	.00	.00	3.	*	1	1835	224	.00	.00	.00	0.
1	0610	75	.00	.00	.00	1.	*	1	1840	225	.00	.00	.00	0.
1	0615	76	.00	.00	.00	1.	*	1	1845	226	.00	.00	.00	0.
1	0620	77	.00	.00	.00	0.	*	1	1850	227	.00	.00	.00	0.
1	0625	78	.00	.00	.00	0.	*	1	1855	228	.00	.00	.00	0.
1	0630	79	.00	.00	.00	0.	*	1	1900	229	.00	.00	.00	0.
1	0635	80	.00	.00	.00	0.	*	1	1905	230	.00	.00	.00	0.
1	0640	81	.00	.00	.00	0.	*	1	1910	231	.00	.00	.00	0.
1	0645	82	.00	.00	.00	0.	*	1	1915	232	.00	.00	.00	0.
1	0650	83	.00	.00	.00	0.	*	1	1920	233	.00	.00	.00	0.
1	0655	84	.00	.00	.00	0.	*	1	1925	234	.00	.00	.00	0.
1	0700	85	.00	.00	.00	0.	*	1	1930	235	.00	.00	.00	0.
1	0705	86	.00	.00	.00	0.	*	1	1935	236	.00	.00	.00	0.
1	0710	87	.00	.00	.00	0.	*	1	1940	237	.00	.00	.00	0.
1	0715	88	.00	.00	.00	0.	*	1	1945	238	.00	.00	.00	0.
1	0720	89	.00	.00	.00	0.	*	1	1950	239	.00	.00	.00	0.
1	0725	90	.00	.00	.00	0.	*	1	1955	240	.00	.00	.00	0.
1	0730	91	.00	.00	.00	0.	*	1	2000	241	.00	.00	.00	0.
1	0735	92	.00	.00	.00	0.	*	1	2005	242	.00	.00	.00	0.
1	0740	93	.00	.00	.00	0.	*	1	2010	243	.00	.00	.00	0.
1	0745	94	.00	.00	.00	0.	*	1	2015	244	.00	.00	.00	0.
1	0750	95	.00	.00	.00	0.	*	1	2020	245	.00	.00	.00	0.
1	0755	96	.00	.00	.00	0.	*	1	2025	246	.00	.00	.00	0.
1	0800	97	.00	.00	.00	0.	*	1	2030	247	.00	.00	.00	0.
1	0805	98	.00	.00	.00	0.	*	1	2035	248	.00	.00	.00	0.
1	0810	99	.00	.00	.00	0.	*	1	2040	249	.00	.00	.00	0.
1	0815	100	.00	.00	.00	0.	*	1	2045	250	.00	.00	.00	0.
1	0820	101	.00	.00	.00	0.	*	1	2050	251	.00	.00	.00	0.
1	0825	102	.00	.00	.00	0.	*	1	2055	252	.00	.00	.00	0.
1	0830	103	.00	.00	.00	0.	*	1	2100	253	.00	.00	.00	0.

1	0835	104	.00	.00	.00	0.	*	1	2105	254	.00	.00	.00	0.
1	0840	105	.00	.00	.00	0.	*	1	2110	255	.00	.00	.00	0.
1	0845	106	.00	.00	.00	0.	*	1	2115	256	.00	.00	.00	0.
1	0850	107	.00	.00	.00	0.	*	1	2120	257	.00	.00	.00	0.
1	0855	108	.00	.00	.00	0.	*	1	2125	258	.00	.00	.00	0.
1	0900	109	.00	.00	.00	0.	*	1	2130	259	.00	.00	.00	0.
1	0905	110	.00	.00	.00	0.	*	1	2135	260	.00	.00	.00	0.
1	0910	111	.00	.00	.00	0.	*	1	2140	261	.00	.00	.00	0.
1	0915	112	.00	.00	.00	0.	*	1	2145	262	.00	.00	.00	0.
1	0920	113	.00	.00	.00	0.	*	1	2150	263	.00	.00	.00	0.
1	0925	114	.00	.00	.00	0.	*	1	2155	264	.00	.00	.00	0.
1	0930	115	.00	.00	.00	0.	*	1	2200	265	.00	.00	.00	0.
1	0935	116	.00	.00	.00	0.	*	1	2205	266	.00	.00	.00	0.
1	0940	117	.00	.00	.00	0.	*	1	2210	267	.00	.00	.00	0.
1	0945	118	.00	.00	.00	0.	*	1	2215	268	.00	.00	.00	0.
1	0950	119	.00	.00	.00	0.	*	1	2220	269	.00	.00	.00	0.
1	0955	120	.00	.00	.00	0.	*	1	2225	270	.00	.00	.00	0.
1	1000	121	.00	.00	.00	0.	*	1	2230	271	.00	.00	.00	0.
1	1005	122	.00	.00	.00	0.	*	1	2235	272	.00	.00	.00	0.
1	1010	123	.00	.00	.00	0.	*	1	2240	273	.00	.00	.00	0.
1	1015	124	.00	.00	.00	0.	*	1	2245	274	.00	.00	.00	0.
1	1020	125	.00	.00	.00	0.	*	1	2250	275	.00	.00	.00	0.
1	1025	126	.00	.00	.00	0.	*	1	2255	276	.00	.00	.00	0.
1	1030	127	.00	.00	.00	0.	*	1	2300	277	.00	.00	.00	0.
1	1035	128	.00	.00	.00	0.	*	1	2305	278	.00	.00	.00	0.
1	1040	129	.00	.00	.00	0.	*	1	2310	279	.00	.00	.00	0.
1	1045	130	.00	.00	.00	0.	*	1	2315	280	.00	.00	.00	0.
1	1050	131	.00	.00	.00	0.	*	1	2320	281	.00	.00	.00	0.
1	1055	132	.00	.00	.00	0.	*	1	2325	282	.00	.00	.00	0.
1	1100	133	.00	.00	.00	0.	*	1	2330	283	.00	.00	.00	0.
1	1105	134	.00	.00	.00	0.	*	1	2335	284	.00	.00	.00	0.
1	1110	135	.00	.00	.00	0.	*	1	2340	285	.00	.00	.00	0.
1	1115	136	.00	.00	.00	0.	*	1	2345	286	.00	.00	.00	0.
1	1120	137	.00	.00	.00	0.	*	1	2350	287	.00	.00	.00	0.
1	1125	138	.00	.00	.00	0.	*	1	2355	288	.00	.00	.00	0.
1	1130	139	.00	.00	.00	0.	*	2	0000	289	.00	.00	.00	0.
1	1135	140	.00	.00	.00	0.	*	2	0005	290	.00	.00	.00	0.
1	1140	141	.00	.00	.00	0.	*	2	0010	291	.00	.00	.00	0.
1	1145	142	.00	.00	.00	0.	*	2	0015	292	.00	.00	.00	0.
1	1150	143	.00	.00	.00	0.	*	2	0020	293	.00	.00	.00	0.
1	1155	144	.00	.00	.00	0.	*	2	0025	294	.00	.00	.00	0.
1	1200	145	.00	.00	.00	0.	*	2	0030	295	.00	.00	.00	0.
1	1205	146	.00	.00	.00	0.	*	2	0035	296	.00	.00	.00	0.
1	1210	147	.00	.00	.00	0.	*	2	0040	297	.00	.00	.00	0.
1	1215	148	.00	.00	.00	0.	*	2	0045	298	.00	.00	.00	0.
1	1220	149	.00	.00	.00	0.	*	2	0050	299	.00	.00	.00	0.
1	1225	150	.00	.00	.00	0.	*	2	0055	300	.00	.00	.00	0.
							*							

****

TOTAL RAINFALL = 3.43, TOTAL LOSS = 1.33, TOTAL EXCESS = 2.10

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.92-HR
+ (CFS)	(HR)					
		(CFS)				
+ 358.	3.50		43.	11.	10.	10.
		(INCHES)	2.103	2.103	2.103	2.103
		(AC-FT)	21.	21.	21.	21.

CUMULATIVE AREA = .19 SQ MI

WARNING *** TIME INTERVAL IS GREATER THAN .29*LAG

****

HYDROGRAPH AT STATION 8
PLAN 1, RATIO = .90

****

DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q		DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q
1		0000	1	.00	.00	.00	0.	*	1		1230	151	.00	.00	.00	0.
1		0005	2	.06	.06	.00	0.	*	1		1235	152	.00	.00	.00	0.
1		0010	3	.11	.11	.00	0.	*	1		1240	153	.00	.00	.00	0.
1		0015	4	.04	.04	.00	0.	*	1		1245	154	.00	.00	.00	0.
1		0020	5	.05	.05	.00	0.	*	1		1250	155	.00	.00	.00	0.
1		0025	6	.06	.06	.00	0.	*	1		1255	156	.00	.00	.00	0.
1		0030	7	.05	.05	.00	2.	*	1		1300	157	.00	.00	.00	0.
1		0035	8	.02	.02	.00	3.	*	1		1305	158	.00	.00	.00	0.
1		0040	9	.00	.00	.00	2.	*	1		1310	159	.00	.00	.00	0.
1		0045	10	.00	.00	.00	1.	*	1		1315	160	.00	.00	.00	0.
1		0050	11	.00	.00	.00	0.	*	1		1320	161	.00	.00	.00	0.
1		0055	12	.00	.00	.00	0.	*	1		1325	162	.00	.00	.00	0.
1		0100	13	.00	.00	.00	0.	*	1		1330	163	.00	.00	.00	0.
1		0105	14	.01	.01	.00	0.	*	1		1335	164	.00	.00	.00	0.
1		0110	15	.02	.02	.00	2.	*	1		1340	165	.00	.00	.00	0.
1		0115	16	.01	.01	.00	3.	*	1		1345	166	.00	.00	.00	0.
1		0120	17	.02	.02	.00	3.	*	1		1350	167	.00	.00	.00	0.
1		0125	18	.03	.03	.01	5.	*	1		1355	168	.00	.00	.00	0.
1		0130	19	.04	.03	.01	9.	*	1		1400	169	.00	.00	.00	0.

1	0135	20	.03	.02	.01	11.	*	1	1405	170	.00	.00	.00	0.
1	0140	21	.03	.02	.01	11.	*	1	1410	171	.00	.00	.00	0.
1	0145	22	.02	.02	.01	11.	*	1	1415	172	.00	.00	.00	0.
1	0150	23	.01	.00	.00	8.	*	1	1420	173	.00	.00	.00	0.
1	0155	24	.00	.00	.00	5.	*	1	1425	174	.00	.00	.00	0.
1	0200	25	.00	.00	.00	3.	*	1	1430	175	.00	.00	.00	0.
1	0205	26	.01	.01	.00	3.	*	1	1435	176	.00	.00	.00	0.
1	0210	27	.03	.02	.01	7.	*	1	1440	177	.00	.00	.00	0.
1	0215	28	.05	.03	.02	14.	*	1	1445	178	.00	.00	.00	0.
1	0220	29	.04	.02	.01	19.	*	1	1450	179	.00	.00	.00	0.
1	0225	30	.02	.01	.01	19.	*	1	1455	180	.00	.00	.00	0.
1	0230	31	.01	.00	.00	13.	*	1	1500	181	.00	.00	.00	0.
1	0235	32	.02	.01	.01	9.	*	1	1505	182	.00	.00	.00	0.
1	0240	33	.04	.02	.02	15.	*	1	1510	183	.00	.00	.00	0.
1	0245	34	.02	.01	.01	19.	*	1	1515	184	.00	.00	.00	0.
1	0250	35	.01	.00	.00	15.	*	1	1520	185	.00	.00	.00	0.
1	0255	36	.01	.00	.00	9.	*	1	1525	186	.00	.00	.00	0.
1	0300	37	.04	.02	.02	12.	*	1	1530	187	.00	.00	.00	0.
1	0305	38	.08	.04	.04	31.	*	1	1535	188	.00	.00	.00	0.
1	0310	39	.09	.04	.05	53.	*	1	1540	189	.00	.00	.00	0.
1	0315	40	.18	.07	.10	88.	*	1	1545	190	.00	.00	.00	0.
1	0320	41	.28	.09	.18	160.	*	1	1550	191	.00	.00	.00	0.
1	0325	42	.28	.08	.20	233.	*	1	1555	192	.00	.00	.00	0.
1	0330	43	.37	.08	.29	308.	*	1	1600	193	.00	.00	.00	0.
1	0335	44	.10	.02	.08	292.	*	1	1605	194	.00	.00	.00	0.
1	0340	45	.11	.02	.09	200.	*	1	1610	195	.00	.00	.00	0.
1	0345	46	.10	.02	.08	155.	*	1	1615	196	.00	.00	.00	0.
1	0350	47	.02	.00	.02	107.	*	1	1620	197	.00	.00	.00	0.
1	0355	48	.05	.01	.04	69.	*	1	1625	198	.00	.00	.00	0.
1	0400	49	.05	.01	.04	63.	*	1	1630	199	.00	.00	.00	0.
1	0405	50	.02	.00	.01	50.	*	1	1635	200	.00	.00	.00	0.
1	0410	51	.01	.00	.01	31.	*	1	1640	201	.00	.00	.00	0.
1	0415	52	.02	.00	.02	26.	*	1	1645	202	.00	.00	.00	0.
1	0420	53	.02	.00	.02	28.	*	1	1650	203	.00	.00	.00	0.
1	0425	54	.04	.01	.03	34.	*	1	1655	204	.00	.00	.00	0.
1	0430	55	.07	.01	.06	52.	*	1	1700	205	.00	.00	.00	0.
1	0435	56	.05	.01	.04	65.	*	1	1705	206	.00	.00	.00	0.
1	0440	57	.03	.00	.03	59.	*	1	1710	207	.00	.00	.00	0.
1	0445	58	.04	.01	.03	52.	*	1	1715	208	.00	.00	.00	0.
1	0450	59	.06	.01	.05	59.	*	1	1720	209	.00	.00	.00	0.
1	0455	60	.02	.00	.02	55.	*	1	1725	210	.00	.00	.00	0.
1	0500	61	.02	.00	.02	37.	*	1	1730	211	.00	.00	.00	0.
1	0505	62	.01	.00	.01	26.	*	1	1735	212	.00	.00	.00	0.
1	0510	63	.01	.00	.01	16.	*	1	1740	213	.00	.00	.00	0.
1	0515	64	.01	.00	.01	11.	*	1	1745	214	.00	.00	.00	0.
1	0520	65	.00	.00	.00	8.	*	1	1750	215	.00	.00	.00	0.
1	0525	66	.01	.00	.01	8.	*	1	1755	216	.00	.00	.00	0.
1	0530	67	.00	.00	.00	7.	*	1	1800	217	.00	.00	.00	0.
1	0535	68	.00	.00	.00	4.	*	1	1805	218	.00	.00	.00	0.
1	0540	69	.00	.00	.00	4.	*	1	1810	219	.00	.00	.00	0.
1	0545	70	.01	.00	.01	6.	*	1	1815	220	.00	.00	.00	0.
1	0550	71	.00	.00	.00	6.	*	1	1820	221	.00	.00	.00	0.
1	0555	72	.00	.00	.00	4.	*	1	1825	222	.00	.00	.00	0.
1	0600	73	.00	.00	.00	4.	*	1	1830	223	.00	.00	.00	0.
1	0605	74	.00	.00	.00	3.	*	1	1835	224	.00	.00	.00	0.
1	0610	75	.00	.00	.00	1.	*	1	1840	225	.00	.00	.00	0.
1	0615	76	.00	.00	.00	0.	*	1	1845	226	.00	.00	.00	0.
1	0620	77	.00	.00	.00	0.	*	1	1850	227	.00	.00	.00	0.
1	0625	78	.00	.00	.00	0.	*	1	1855	228	.00	.00	.00	0.
1	0630	79	.00	.00	.00	0.	*	1	1900	229	.00	.00	.00	0.
1	0635	80	.00	.00	.00	0.	*	1	1905	230	.00	.00	.00	0.
1	0640	81	.00	.00	.00	0.	*	1	1910	231	.00	.00	.00	0.
1	0645	82	.00	.00	.00	0.	*	1	1915	232	.00	.00	.00	0.
1	0650	83	.00	.00	.00	0.	*	1	1920	233	.00	.00	.00	0.
1	0655	84	.00	.00	.00	0.	*	1	1925	234	.00	.00	.00	0.
1	0700	85	.00	.00	.00	0.	*	1	1930	235	.00	.00	.00	0.
1	0705	86	.00	.00	.00	0.	*	1	1935	236	.00	.00	.00	0.
1	0710	87	.00	.00	.00	0.	*	1	1940	237	.00	.00	.00	0.
1	0715	88	.00	.00	.00	0.	*	1	1945	238	.00	.00	.00	0.
1	0720	89	.00	.00	.00	0.	*	1	1950	239	.00	.00	.00	0.
1	0725	90	.00	.00	.00	0.	*	1	1955	240	.00	.00	.00	0.
1	0730	91	.00	.00	.00	0.	*	1	2000	241	.00	.00	.00	0.
1	0735	92	.00	.00	.00	0.	*	1	2005	242	.00	.00	.00	0.
1	0740	93	.00	.00	.00	0.	*	1	2010	243	.00	.00	.00	0.
1	0745	94	.00	.00	.00	0.	*	1	2015	244	.00	.00	.00	0.
1	0750	95	.00	.00	.00	0.	*	1	2020	245	.00	.00	.00	0.
1	0755	96	.00	.00	.00	0.	*	1	2025	246	.00	.00	.00	0.
1	0800	97	.00	.00	.00	0.	*	1	2030	247	.00	.00	.00	0.
1	0805	98	.00	.00	.00	0.	*	1	2035	248	.00	.00	.00	0.
1	0810	99	.00	.00	.00	0.	*	1	2040	249	.00	.00	.00	0.
1	0815	100	.00	.00	.00	0.	*	1	2045	250	.00	.00	.00	0.
1	0820	101	.00	.00	.00	0.	*	1	2050	251	.00	.00	.00	0.
1	0825	102	.00	.00	.00	0.	*	1	2055	252	.00	.00	.00	0.
1	0830	103	.00	.00	.00	0.	*	1	2100	253	.00	.00	.00	0.
1	0835	104	.00	.00	.00	0.	*	1	2105	254	.00	.00	.00	0.
1	0840	105	.00	.00	.00	0.	*	1	2110	255	.00	.00	.00	0.
1	0845	106	.00	.00	.00	0.	*	1	2115	256	.00	.00	.00	0.
1	0850	107	.00	.00	.00	0.	*	1	2120	257	.00	.00	.00	0.
1	0855	108	.00	.00	.00	0.	*	1	2125	258	.00	.00	.00	0.
1	0900	109	.00	.00	.00	0.	*	1	2130	259	.00	.00	.00	0.
1	0905	110	.00	.00	.00	0.	*	1	2135	260	.00	.00	.00	0.
1	0910	111	.00	.00	.00	0.	*	1	2140	261	.00	.00	.00	0.
1	0915	112	.00	.00	.00	0.	*	1	2145	262	.00	.00	.00	0.
1	0920	113	.00	.00	.00	0.	*	1	2150	263	.00	.00	.00	0.
1	0925	114	.00	.00	.00	0.	*	1	2155	264	.00	.00	.00	0.
1	0930	115	.00	.00	.00	0.	*	1	2200	265	.00	.00	.00	0.
1	0935	116	.00	.00	.00	0.	*	1	2205	266	.00	.00	.00	0.
1	0940	117	.00	.00	.00	0.	*	1	2210	267	.00	.00	.00	0.
1	0945	118	.00	.00	.00	0.	*	1	2215	268	.00	.00	.00	0.

1	0950	119	.00	.00	.00	0.	*	1	2220	269	.00	.00	.00	0.
1	0955	120	.00	.00	.00	0.	*	1	2225	270	.00	.00	.00	0.
1	1000	121	.00	.00	.00	0.	*	1	2230	271	.00	.00	.00	0.
1	1005	122	.00	.00	.00	0.	*	1	2235	272	.00	.00	.00	0.
1	1010	123	.00	.00	.00	0.	*	1	2240	273	.00	.00	.00	0.
1	1015	124	.00	.00	.00	0.	*	1	2245	274	.00	.00	.00	0.
1	1020	125	.00	.00	.00	0.	*	1	2250	275	.00	.00	.00	0.
1	1025	126	.00	.00	.00	0.	*	1	2255	276	.00	.00	.00	0.
1	1030	127	.00	.00	.00	0.	*	1	2300	277	.00	.00	.00	0.
1	1035	128	.00	.00	.00	0.	*	1	2305	278	.00	.00	.00	0.
1	1040	129	.00	.00	.00	0.	*	1	2310	279	.00	.00	.00	0.
1	1045	130	.00	.00	.00	0.	*	1	2315	280	.00	.00	.00	0.
1	1050	131	.00	.00	.00	0.	*	1	2320	281	.00	.00	.00	0.
1	1055	132	.00	.00	.00	0.	*	1	2325	282	.00	.00	.00	0.
1	1100	133	.00	.00	.00	0.	*	1	2330	283	.00	.00	.00	0.
1	1105	134	.00	.00	.00	0.	*	1	2335	284	.00	.00	.00	0.
1	1110	135	.00	.00	.00	0.	*	1	2340	285	.00	.00	.00	0.
1	1115	136	.00	.00	.00	0.	*	1	2345	286	.00	.00	.00	0.
1	1120	137	.00	.00	.00	0.	*	1	2350	287	.00	.00	.00	0.
1	1125	138	.00	.00	.00	0.	*	1	2355	288	.00	.00	.00	0.
1	1130	139	.00	.00	.00	0.	*	2	0000	289	.00	.00	.00	0.
1	1135	140	.00	.00	.00	0.	*	2	0005	290	.00	.00	.00	0.
1	1140	141	.00	.00	.00	0.	*	2	0010	291	.00	.00	.00	0.
1	1145	142	.00	.00	.00	0.	*	2	0015	292	.00	.00	.00	0.
1	1150	143	.00	.00	.00	0.	*	2	0020	293	.00	.00	.00	0.
1	1155	144	.00	.00	.00	0.	*	2	0025	294	.00	.00	.00	0.
1	1200	145	.00	.00	.00	0.	*	2	0030	295	.00	.00	.00	0.
1	1205	146	.00	.00	.00	0.	*	2	0035	296	.00	.00	.00	0.
1	1210	147	.00	.00	.00	0.	*	2	0040	297	.00	.00	.00	0.
1	1215	148	.00	.00	.00	0.	*	2	0045	298	.00	.00	.00	0.
1	1220	149	.00	.00	.00	0.	*	2	0050	299	.00	.00	.00	0.
1	1225	150	.00	.00	.00	0.	*	2	0055	300	.00	.00	.00	0.
							*							

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TOTAL RAINFALL = 3.09, TOTAL LOSS = 1.29, TOTAL EXCESS = 1.80

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.92-HR
(CFS)	(HR)					
		(CFS)				
308.	3.50		37.	9.	9.	9.
		(INCHES)	1.799	1.799	1.799	1.799
		(AC-FT)	18.	18.	18.	18.

CUMULATIVE AREA = .19 SQ MI

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          **************
          *            *
61 KK     *        9   *
          *            *
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             SUBBASIN RUNOFF DATA

62 BA          SUBBASIN CHARACTERISTICS
                    TAREA        1.63  SUBBASIN AREA

               PRECIPITATION DATA

26 PB               STORM        3.43  BASIN TOTAL PRECIPITATION

27 PI            INCREMENTAL PRECIPITATION PATTERN
                    .02       .04       .01       .02       .02       .02       .01       .00       .00       .00
                    .00       .00       .00       .01       .00       .01       .01       .01       .01       .01
                    .01       .00       .00       .00       .00       .01       .02       .01       .01       .00
                    .01       .01       .01       .00       .00       .01       .03       .03       .06       .09
                    .09       .12       .03       .04       .03       .01       .02       .02       .00       .00
                    .01       .01       .01       .02       .02       .01       .01       .02       .01       .01
                    .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                    .00       .00

63 LS          SCS LOSS RATE
                    STRTL        .31  INITIAL ABSTRACTION
                   CRVNBR      86.50  CURVE NUMBER
                    RTIMP        .00  PERCENT IMPERVIOUS AREA

64 UD          SCS DIMENSIONLESS UNITGRAPH
                    TLAG        .33  LAG

                                                ***

                                          UNIT HYDROGRAPH
                                       22 END-OF-PERIOD ORDINATES
               261.      833.     1664.     2107.     2072.     1741.     1248.      826.      573.      406.
               279.      194.      133.       92.       64.       44.       31.       22.       16.       10.
                 6.        1.
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HYDROGRAPH AT STATION 9

DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q	DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q
1		0000	1	.00	.00	.00	0.	1		1230	151	.00	.00	.00	0.
1		0005	2	.07	.07	.00	0.	1		1235	152	.00	.00	.00	0.
1		0010	3	.13	.13	.00	0.	1		1240	153	.00	.00	.00	0.
1		0015	4	.04	.04	.00	0.	1		1245	154	.00	.00	.00	0.
1		0020	5	.06	.06	.00	0.	1		1250	155	.00	.00	.00	0.
1		0025	6	.07	.07	.00	1.	1		1255	156	.00	.00	.00	0.
1		0030	7	.05	.05	.01	3.	1		1300	157	.00	.00	.00	0.
1		0035	8	.02	.02	.00	9.	1		1305	158	.00	.00	.00	0.
1		0040	9	.00	.00	.00	16.	1		1310	159	.00	.00	.00	0.
1		0045	10	.00	.00	.00	21.	1		1315	160	.00	.00	.00	0.
1		0050	11	.00	.00	.00	21.	1		1320	161	.00	.00	.00	0.
1		0055	12	.00	.00	.00	18.	1		1325	162	.00	.00	.00	0.
1		0100	13	.00	.00	.00	14.	1		1330	163	.00	.00	.00	0.
1		0105	14	.01	.01	.00	10.	1		1335	164	.00	.00	.00	0.
1		0110	15	.02	.02	.00	9.	1		1340	165	.00	.00	.00	0.
1		0115	16	.01	.01	.00	11.	1		1345	166	.00	.00	.00	0.
1		0120	17	.02	.02	.00	16.	1		1350	167	.00	.00	.00	0.
1		0125	18	.03	.03	.01	22.	1		1355	168	.00	.00	.00	0.
1		0130	19	.05	.04	.01	32.	1		1400	169	.00	.00	.00	0.
1		0135	20	.03	.02	.01	47.	1		1405	170	.00	.00	.00	0.
1		0140	21	.03	.02	.01	65.	1		1410	171	.00	.00	.00	0.
1		0145	22	.02	.02	.01	81.	1		1415	172	.00	.00	.00	0.
1		0150	23	.01	.00	.00	91.	1		1420	173	.00	.00	.00	0.
1		0155	24	.00	.00	.00	93.	1		1425	174	.00	.00	.00	0.
1		0200	25	.00	.00	.00	84.	1		1430	175	.00	.00	.00	0.
1		0205	26	.01	.01	.00	72.	1		1435	176	.00	.00	.00	0.
1		0210	27	.03	.02	.01	62.	1		1440	177	.00	.00	.00	0.
1		0215	28	.05	.03	.02	63.	1		1445	178	.00	.00	.00	0.
1		0220	29	.04	.02	.02	80.	1		1450	179	.00	.00	.00	0.
1		0225	30	.03	.02	.01	107.	1		1455	180	.00	.00	.00	0.
1		0230	31	.01	.00	.00	130.	1		1500	181	.00	.00	.00	0.
1		0235	32	.02	.01	.01	140.	1		1505	182	.00	.00	.00	0.
1		0240	33	.05	.03	.02	140.	1		1510	183	.00	.00	.00	0.
1		0245	34	.03	.01	.01	140.	1		1515	184	.00	.00	.00	0.
1		0250	35	.01	.01	.01	145.	1		1520	185	.00	.00	.00	0.
1		0255	36	.01	.00	.00	147.	1		1525	186	.00	.00	.00	0.
1		0300	37	.04	.02	.02	144.	1		1530	187	.00	.00	.00	0.
1		0305	38	.09	.04	.05	151.	1		1535	188	.00	.00	.00	0.
1		0310	39	.10	.04	.06	187.	1		1540	189	.00	.00	.00	0.
1		0315	40	.20	.07	.12	278.	1		1545	190	.00	.00	.00	0.
1		0320	41	.31	.10	.21	455.	1		1550	191	.00	.00	.00	0.
1		0325	42	.31	.08	.23	742.	1		1555	192	.00	.00	.00	0.
1		0330	43	.41	.08	.33	1153.	1		1600	193	.00	.00	.00	0.
1		0335	44	.12	.02	.10	1589.	1		1605	194	.00	.00	.00	0.
1		0340	45	.13	.02	.11	1940.	1		1610	195	.00	.00	.00	0.
1		0345	46	.11	.02	.09	2066.	1		1615	196	.00	.00	.00	0.
1		0350	47	.02	.00	.02	1980.	1		1620	197	.00	.00	.00	0.
1		0355	48	.05	.01	.05	1757.	1		1625	198	.00	.00	.00	0.
1		0400	49	.05	.01	.05	1469.	1		1630	199	.00	.00	.00	0.
1		0405	50	.02	.00	.01	1203.	1		1635	200	.00	.00	.00	0.
1		0410	51	.01	.00	.01	985.	1		1640	201	.00	.00	.00	0.
1		0415	52	.03	.00	.02	794.	1		1645	202	.00	.00	.00	0.
1		0420	53	.03	.00	.02	639.	1		1650	203	.00	.00	.00	0.
1		0425	54	.04	.01	.04	530.	1		1655	204	.00	.00	.00	0.
1		0430	55	.08	.01	.07	468.	1		1700	205	.00	.00	.00	0.
1		0435	56	.05	.01	.05	458.	1		1705	206	.00	.00	.00	0.
1		0440	57	.04	.00	.03	485.	1		1710	207	.00	.00	.00	0.
1		0445	58	.04	.01	.04	512.	1		1715	208	.00	.00	.00	0.
1		0450	59	.07	.01	.06	529.	1		1720	209	.00	.00	.00	0.
1		0455	60	.02	.00	.02	535.	1		1725	210	.00	.00	.00	0.
1		0500	61	.02	.00	.02	526.	1		1730	211	.00	.00	.00	0.
1		0505	62	.01	.00	.01	489.	1		1735	212	.00	.00	.00	0.
1		0510	63	.01	.00	.01	431.	1		1740	213	.00	.00	.00	0.
1		0515	64	.01	.00	.01	361.	1		1745	214	.00	.00	.00	0.
1		0520	65	.00	.00	.00	287.	1		1750	215	.00	.00	.00	0.
1		0525	66	.01	.00	.01	225.	1		1755	216	.00	.00	.00	0.
1		0530	67	.00	.00	.00	178.	1		1800	217	.00	.00	.00	0.
1		0535	68	.00	.00	.00	142.	1		1805	218	.00	.00	.00	0.
1		0540	69	.00	.00	.00	113.	1		1810	219	.00	.00	.00	0.
1		0545	70	.01	.00	.01	93.	1		1815	220	.00	.00	.00	0.
1		0550	71	.00	.00	.00	79.	1		1820	221	.00	.00	.00	0.
1		0555	72	.00	.00	.00	71.	1		1825	222	.00	.00	.00	0.
1		0600	73	.00	.00	.00	63.	1		1830	223	.00	.00	.00	0.
1		0605	74	.00	.00	.00	55.	1		1835	224	.00	.00	.00	0.
1		0610	75	.00	.00	.00	47.	1		1840	225	.00	.00	.00	0.
1		0615	76	.00	.00	.00	37.	1		1845	226	.00	.00	.00	0.
1		0620	77	.00	.00	.00	28.	1		1850	227	.00	.00	.00	0.
1		0625	78	.00	.00	.00	20.	1		1855	228	.00	.00	.00	0.
1		0630	79	.00	.00	.00	14.	1		1900	229	.00	.00	.00	0.
1		0635	80	.00	.00	.00	9.	1		1905	230	.00	.00	.00	0.
1		0640	81	.00	.00	.00	6.	1		1910	231	.00	.00	.00	0.
1		0645	82	.00	.00	.00	4.	1		1915	232	.00	.00	.00	0.
1		0650	83	.00	.00	.00	3.	1		1920	233	.00	.00	.00	0.
1		0655	84	.00	.00	.00	2.	1		1925	234	.00	.00	.00	0.
1		0700	85	.00	.00	.00	1.	1		1930	235	.00	.00	.00	0.
1		0705	86	.00	.00	.00	1.	1		1935	236	.00	.00	.00	0.
1		0710	87	.00	.00	.00	1.	1		1940	237	.00	.00	.00	0.
1		0715	88	.00	.00	.00	0.	1		1945	238	.00	.00	.00	0.
1		0720	89	.00	.00	.00	0.	1		1950	239	.00	.00	.00	0.

DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q		DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q
1		0725	90	.00	.00	.00	0.	*	1		1955	240	.00	.00	.00	0.
1		0730	91	.00	.00	.00	0.	*	1		2000	241	.00	.00	.00	0.
1		0735	92	.00	.00	.00	0.	*	1		2005	242	.00	.00	.00	0.
1		0740	93	.00	.00	.00	0.	*	1		2010	243	.00	.00	.00	0.
1		0745	94	.00	.00	.00	0.	*	1		2015	244	.00	.00	.00	0.
1		0750	95	.00	.00	.00	0.	*	1		2020	245	.00	.00	.00	0.
1		0755	96	.00	.00	.00	0.	*	1		2025	246	.00	.00	.00	0.
1		0800	97	.00	.00	.00	0.	*	1		2030	247	.00	.00	.00	0.
1		0805	98	.00	.00	.00	0.	*	1		2035	248	.00	.00	.00	0.
1		0810	99	.00	.00	.00	0.	*	1		2040	249	.00	.00	.00	0.
1		0815	100	.00	.00	.00	0.	*	1		2045	250	.00	.00	.00	0.
1		0820	101	.00	.00	.00	0.	*	1		2050	251	.00	.00	.00	0.
1		0825	102	.00	.00	.00	0.	*	1		2055	252	.00	.00	.00	0.
1		0830	103	.00	.00	.00	0.	*	1		2100	253	.00	.00	.00	0.
1		0835	104	.00	.00	.00	0.	*	1		2105	254	.00	.00	.00	0.
1		0840	105	.00	.00	.00	0.	*	1		2110	255	.00	.00	.00	0.
1		0845	106	.00	.00	.00	0.	*	1		2115	256	.00	.00	.00	0.
1		0850	107	.00	.00	.00	0.	*	1		2120	257	.00	.00	.00	0.
1		0855	108	.00	.00	.00	0.	*	1		2125	258	.00	.00	.00	0.
1		0900	109	.00	.00	.00	0.	*	1		2130	259	.00	.00	.00	0.
1		0905	110	.00	.00	.00	0.	*	1		2135	260	.00	.00	.00	0.
1		0910	111	.00	.00	.00	0.	*	1		2140	261	.00	.00	.00	0.
1		0915	112	.00	.00	.00	0.	*	1		2145	262	.00	.00	.00	0.
1		0920	113	.00	.00	.00	0.	*	1		2150	263	.00	.00	.00	0.
1		0925	114	.00	.00	.00	0.	*	1		2155	264	.00	.00	.00	0.
1		0930	115	.00	.00	.00	0.	*	1		2200	265	.00	.00	.00	0.
1		0935	116	.00	.00	.00	0.	*	1		2205	266	.00	.00	.00	0.
1		0940	117	.00	.00	.00	0.	*	1		2210	267	.00	.00	.00	0.
1		0945	118	.00	.00	.00	0.	*	1		2215	268	.00	.00	.00	0.
1		0950	119	.00	.00	.00	0.	*	1		2220	269	.00	.00	.00	0.
1		0955	120	.00	.00	.00	0.	*	1		2225	270	.00	.00	.00	0.
1		1000	121	.00	.00	.00	0.	*	1		2230	271	.00	.00	.00	0.
1		1005	122	.00	.00	.00	0.	*	1		2235	272	.00	.00	.00	0.
1		1010	123	.00	.00	.00	0.	*	1		2240	273	.00	.00	.00	0.
1		1015	124	.00	.00	.00	0.	*	1		2245	274	.00	.00	.00	0.
1		1020	125	.00	.00	.00	0.	*	1		2250	275	.00	.00	.00	0.
1		1025	126	.00	.00	.00	0.	*	1		2255	276	.00	.00	.00	0.
1		1030	127	.00	.00	.00	0.	*	1		2300	277	.00	.00	.00	0.
1		1035	128	.00	.00	.00	0.	*	1		2305	278	.00	.00	.00	0.
1		1040	129	.00	.00	.00	0.	*	1		2310	279	.00	.00	.00	0.
1		1045	130	.00	.00	.00	0.	*	1		2315	280	.00	.00	.00	0.
1		1050	131	.00	.00	.00	0.	*	1		2320	281	.00	.00	.00	0.
1		1055	132	.00	.00	.00	0.	*	1		2325	282	.00	.00	.00	0.
1		1100	133	.00	.00	.00	0.	*	1		2330	283	.00	.00	.00	0.
1		1105	134	.00	.00	.00	0.	*	1		2335	284	.00	.00	.00	0.
1		1110	135	.00	.00	.00	0.	*	1		2340	285	.00	.00	.00	0.
1		1115	136	.00	.00	.00	0.	*	1		2345	286	.00	.00	.00	0.
1		1120	137	.00	.00	.00	0.	*	1		2350	287	.00	.00	.00	0.
1		1125	138	.00	.00	.00	0.	*	1		2355	288	.00	.00	.00	0.
1		1130	139	.00	.00	.00	0.	*	2		0000	289	.00	.00	.00	0.
1		1135	140	.00	.00	.00	0.	*	2		0005	290	.00	.00	.00	0.
1		1140	141	.00	.00	.00	0.	*	2		0010	291	.00	.00	.00	0.
1		1145	142	.00	.00	.00	0.	*	2		0015	292	.00	.00	.00	0.
1		1150	143	.00	.00	.00	0.	*	2		0020	293	.00	.00	.00	0.
1		1155	144	.00	.00	.00	0.	*	2		0025	294	.00	.00	.00	0.
1		1200	145	.00	.00	.00	0.	*	2		0030	295	.00	.00	.00	0.
1		1205	146	.00	.00	.00	0.	*	2		0035	296	.00	.00	.00	0.
1		1210	147	.00	.00	.00	0.	*	2		0040	297	.00	.00	.00	0.
1		1215	148	.00	.00	.00	0.	*	2		0045	298	.00	.00	.00	0.
1		1220	149	.00	.00	.00	0.	*	2		0050	299	.00	.00	.00	0.
1		1225	150	.00	.00	.00	0.	*	2		0055	300	.00	.00	.00	0.

TOTAL RAINFALL = 3.43, TOTAL LOSS = 1.35, TOTAL EXCESS = 2.08

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.92-HR
(CFS)	(HR)					
		(CFS)				
2066.	3.75		364.	91.	88.	88.
		(INCHES)	2.075	2.078	2.078	2.078
		(AC-FT)	180.	181.	181.	181.

CUMULATIVE AREA = 1.63 SQ MI

HYDROGRAPH AT STATION 9
PLAN 1, RATIO = .90

1	0035	8	.02	.02	.00	3.	*	1	1305	158	.00	.00	.00	0.
1	0040	9	.00	.00	.00	7.	*	1	1310	159	.00	.00	.00	0.
1	0045	10	.00	.00	.00	9.	*	1	1315	160	.00	.00	.00	0.
1	0050	11	.00	.00	.00	10.	*	1	1320	161	.00	.00	.00	0.
1	0055	12	.00	.00	.00	9.	*	1	1325	162	.00	.00	.00	0.
1	0100	13	.00	.00	.00	7.	*	1	1330	163	.00	.00	.00	0.
1	0105	14	.01	.01	.00	5.	*	1	1335	164	.00	.00	.00	0.
1	0110	15	.02	.02	.00	5.	*	1	1340	165	.00	.00	.00	0.
1	0115	16	.01	.01	.00	6.	*	1	1345	166	.00	.00	.00	0.
1	0120	17	.02	.02	.00	10.	*	1	1350	167	.00	.00	.00	0.
1	0125	18	.03	.03	.01	14.	*	1	1355	168	.00	.00	.00	0.
1	0130	19	.04	.03	.01	22.	*	1	1400	169	.00	.00	.00	0.
1	0135	20	.03	.02	.01	33.	*	1	1405	170	.00	.00	.00	0.
1	0140	21	.03	.02	.01	46.	*	1	1410	171	.00	.00	.00	0.
1	0145	22	.02	.02	.01	59.	*	1	1415	172	.00	.00	.00	0.
1	0150	23	.01	.00	.00	67.	*	1	1420	173	.00	.00	.00	0.
1	0155	24	.00	.00	.00	69.	*	1	1425	174	.00	.00	.00	0.
1	0200	25	.00	.00	.00	63.	*	1	1430	175	.00	.00	.00	0.
1	0205	26	.01	.01	.00	54.	*	1	1435	176	.00	.00	.00	0.
1	0210	27	.03	.02	.01	47.	*	1	1440	177	.00	.00	.00	0.
1	0215	28	.05	.03	.02	48.	*	1	1445	178	.00	.00	.00	0.
1	0220	29	.04	.02	.01	62.	*	1	1450	179	.00	.00	.00	0.
1	0225	30	.02	.01	.01	83.	*	1	1455	180	.00	.00	.00	0.
1	0230	31	.01	.00	.00	102.	*	1	1500	181	.00	.00	.00	0.
1	0235	32	.02	.01	.01	111.	*	1	1505	182	.00	.00	.00	0.
1	0240	33	.04	.02	.02	111.	*	1	1510	183	.00	.00	.00	0.
1	0245	34	.02	.01	.01	112.	*	1	1515	184	.00	.00	.00	0.
1	0250	35	.01	.01	.00	116.	*	1	1520	185	.00	.00	.00	0.
1	0255	36	.01	.00	.00	118.	*	1	1525	186	.00	.00	.00	0.
1	0300	37	.04	.02	.02	116.	*	1	1530	187	.00	.00	.00	0.
1	0305	38	.08	.04	.04	122.	*	1	1535	188	.00	.00	.00	0.
1	0310	39	.09	.04	.05	153.	*	1	1540	189	.00	.00	.00	0.
1	0315	40	.18	.07	.10	229.	*	1	1545	190	.00	.00	.00	0.
1	0320	41	.28	.10	.18	378.	*	1	1550	191	.00	.00	.00	0.
1	0325	42	.28	.08	.20	622.	*	1	1555	192	.00	.00	.00	0.
1	0330	43	.37	.09	.29	975.	*	1	1600	193	.00	.00	.00	0.
1	0335	44	.10	.02	.08	1354.	*	1	1605	194	.00	.00	.00	0.
1	0340	45	.11	.02	.09	1662.	*	1	1610	195	.00	.00	.00	0.
1	0345	46	.10	.02	.08	1776.	*	1	1615	196	.00	.00	.00	0.
1	0350	47	.02	.00	.02	1707.	*	1	1620	197	.00	.00	.00	0.
1	0355	48	.05	.01	.04	1520.	*	1	1625	198	.00	.00	.00	0.
1	0400	49	.05	.01	.04	1272.	*	1	1630	199	.00	.00	.00	0.
1	0405	50	.02	.00	.01	1044.	*	1	1635	200	.00	.00	.00	0.
1	0410	51	.01	.00	.01	856.	*	1	1640	201	.00	.00	.00	0.
1	0415	52	.02	.00	.02	691.	*	1	1645	202	.00	.00	.00	0.
1	0420	53	.02	.00	.02	557.	*	1	1650	203	.00	.00	.00	0.
1	0425	54	.04	.01	.03	462.	*	1	1655	204	.00	.00	.00	0.
1	0430	55	.07	.01	.06	409.	*	1	1700	205	.00	.00	.00	0.
1	0435	56	.05	.01	.04	401.	*	1	1705	206	.00	.00	.00	0.
1	0440	57	.03	.00	.03	425.	*	1	1710	207	.00	.00	.00	0.
1	0445	58	.04	.01	.03	449.	*	1	1715	208	.00	.00	.00	0.
1	0450	59	.06	.01	.05	465.	*	1	1720	209	.00	.00	.00	0.
1	0455	60	.02	.00	.02	470.	*	1	1725	210	.00	.00	.00	0.
1	0500	61	.02	.00	.02	463.	*	1	1730	211	.00	.00	.00	0.
1	0505	62	.01	.00	.01	430.	*	1	1735	212	.00	.00	.00	0.
1	0510	63	.01	.00	.01	379.	*	1	1740	213	.00	.00	.00	0.
1	0515	64	.01	.00	.01	317.	*	1	1745	214	.00	.00	.00	0.
1	0520	65	.00	.00	.00	253.	*	1	1750	215	.00	.00	.00	0.
1	0525	66	.01	.00	.01	198.	*	1	1755	216	.00	.00	.00	0.
1	0530	67	.00	.00	.00	156.	*	1	1800	217	.00	.00	.00	0.
1	0535	68	.00	.00	.00	125.	*	1	1805	218	.00	.00	.00	0.
1	0540	69	.00	.00	.00	100.	*	1	1810	219	.00	.00	.00	0.
1	0545	70	.01	.00	.01	82.	*	1	1815	220	.00	.00	.00	0.
1	0550	71	.00	.00	.00	70.	*	1	1820	221	.00	.00	.00	0.
1	0555	72	.00	.00	.00	62.	*	1	1825	222	.00	.00	.00	0.
1	0600	73	.00	.00	.00	55.	*	1	1830	223	.00	.00	.00	0.
1	0605	74	.00	.00	.00	49.	*	1	1835	224	.00	.00	.00	0.
1	0610	75	.00	.00	.00	42.	*	1	1840	225	.00	.00	.00	0.
1	0615	76	.00	.00	.00	33.	*	1	1845	226	.00	.00	.00	0.
1	0620	77	.00	.00	.00	25.	*	1	1850	227	.00	.00	.00	0.
1	0625	78	.00	.00	.00	18.	*	1	1855	228	.00	.00	.00	0.
1	0630	79	.00	.00	.00	12.	*	1	1900	229	.00	.00	.00	0.
1	0635	80	.00	.00	.00	8.	*	1	1905	230	.00	.00	.00	0.
1	0640	81	.00	.00	.00	6.	*	1	1910	231	.00	.00	.00	0.
1	0645	82	.00	.00	.00	4.	*	1	1915	232	.00	.00	.00	0.
1	0650	83	.00	.00	.00	3.	*	1	1920	233	.00	.00	.00	0.
1	0655	84	.00	.00	.00	2.	*	1	1925	234	.00	.00	.00	0.
1	0700	85	.00	.00	.00	1.	*	1	1930	235	.00	.00	.00	0.
1	0705	86	.00	.00	.00	1.	*	1	1935	236	.00	.00	.00	0.
1	0710	87	.00	.00	.00	1.	*	1	1940	237	.00	.00	.00	0.
1	0715	88	.00	.00	.00	0.	*	1	1945	238	.00	.00	.00	0.
1	0720	89	.00	.00	.00	0.	*	1	1950	239	.00	.00	.00	0.
1	0725	90	.00	.00	.00	0.	*	1	1955	240	.00	.00	.00	0.
1	0730	91	.00	.00	.00	0.	*	1	2000	241	.00	.00	.00	0.
1	0735	92	.00	.00	.00	0.	*	1	2005	242	.00	.00	.00	0.
1	0740	93	.00	.00	.00	0.	*	1	2010	243	.00	.00	.00	0.
1	0745	94	.00	.00	.00	0.	*	1	2015	244	.00	.00	.00	0.
1	0750	95	.00	.00	.00	0.	*	1	2020	245	.00	.00	.00	0.
1	0755	96	.00	.00	.00	0.	*	1	2025	246	.00	.00	.00	0.
1	0800	97	.00	.00	.00	0.	*	1	2030	247	.00	.00	.00	0.
1	0805	98	.00	.00	.00	0.	*	1	2035	248	.00	.00	.00	0.
1	0810	99	.00	.00	.00	0.	*	1	2040	249	.00	.00	.00	0.
1	0815	100	.00	.00	.00	0.	*	1	2045	250	.00	.00	.00	0.
1	0820	101	.00	.00	.00	0.	*	1	2050	251	.00	.00	.00	0.
1	0825	102	.00	.00	.00	0.	*	1	2055	252	.00	.00	.00	0.
1	0830	103	.00	.00	.00	0.	*	1	2100	253	.00	.00	.00	0.
1	0835	104	.00	.00	.00	0.	*	1	2105	254	.00	.00	.00	0.
1	0840	105	.00	.00	.00	0.	*	1	2110	255	.00	.00	.00	0.
1	0845	106	.00	.00	.00	0.	*	1	2115	256	.00	.00	.00	0.

1	0850	107	.00	.00	.00	0.	*	1	2120	257	.00	.00	.00	0.
1	0855	108	.00	.00	.00	0.	*	1	2125	258	.00	.00	.00	0.
1	0900	109	.00	.00	.00	0.	*	1	2130	259	.00	.00	.00	0.
1	0905	110	.00	.00	.00	0.	*	1	2135	260	.00	.00	.00	0.
1	0910	111	.00	.00	.00	0.	*	1	2140	261	.00	.00	.00	0.
1	0915	112	.00	.00	.00	0.	*	1	2145	262	.00	.00	.00	0.
1	0920	113	.00	.00	.00	0.	*	1	2150	263	.00	.00	.00	0.
1	0925	114	.00	.00	.00	0.	*	1	2155	264	.00	.00	.00	0.
1	0930	115	.00	.00	.00	0.	*	1	2200	265	.00	.00	.00	0.
1	0935	116	.00	.00	.00	0.	*	1	2205	266	.00	.00	.00	0.
1	0940	117	.00	.00	.00	0.	*	1	2210	267	.00	.00	.00	0.
1	0945	118	.00	.00	.00	0.	*	1	2215	268	.00	.00	.00	0.
1	0950	119	.00	.00	.00	0.	*	1	2220	269	.00	.00	.00	0.
1	0955	120	.00	.00	.00	0.	*	1	2225	270	.00	.00	.00	0.
1	1000	121	.00	.00	.00	0.	*	1	2230	271	.00	.00	.00	0.
1	1005	122	.00	.00	.00	0.	*	1	2235	272	.00	.00	.00	0.
1	1010	123	.00	.00	.00	0.	*	1	2240	273	.00	.00	.00	0.
1	1015	124	.00	.00	.00	0.	*	1	2245	274	.00	.00	.00	0.
1	1020	125	.00	.00	.00	0.	*	1	2250	275	.00	.00	.00	0.
1	1025	126	.00	.00	.00	0.	*	1	2255	276	.00	.00	.00	0.
1	1030	127	.00	.00	.00	0.	*	1	2300	277	.00	.00	.00	0.
1	1035	128	.00	.00	.00	0.	*	1	2305	278	.00	.00	.00	0.
1	1040	129	.00	.00	.00	0.	*	1	2310	279	.00	.00	.00	0.
1	1045	130	.00	.00	.00	0.	*	1	2315	280	.00	.00	.00	0.
1	1050	131	.00	.00	.00	0.	*	1	2320	281	.00	.00	.00	0.
1	1055	132	.00	.00	.00	0.	*	1	2325	282	.00	.00	.00	0.
1	1100	133	.00	.00	.00	0.	*	1	2330	283	.00	.00	.00	0.
1	1105	134	.00	.00	.00	0.	*	1	2335	284	.00	.00	.00	0.
1	1110	135	.00	.00	.00	0.	*	1	2340	285	.00	.00	.00	0.
1	1115	136	.00	.00	.00	0.	*	1	2345	286	.00	.00	.00	0.
1	1120	137	.00	.00	.00	0.	*	1	2350	287	.00	.00	.00	0.
1	1125	138	.00	.00	.00	0.	*	1	2355	288	.00	.00	.00	0.
1	1130	139	.00	.00	.00	0.	*	2	0000	289	.00	.00	.00	0.
1	1135	140	.00	.00	.00	0.	*	2	0005	290	.00	.00	.00	0.
1	1140	141	.00	.00	.00	0.	*	2	0010	291	.00	.00	.00	0.
1	1145	142	.00	.00	.00	0.	*	2	0015	292	.00	.00	.00	0.
1	1150	143	.00	.00	.00	0.	*	2	0020	293	.00	.00	.00	0.
1	1155	144	.00	.00	.00	0.	*	2	0025	294	.00	.00	.00	0.
1	1200	145	.00	.00	.00	0.	*	2	0030	295	.00	.00	.00	0.
1	1205	146	.00	.00	.00	0.	*	2	0035	296	.00	.00	.00	0.
1	1210	147	.00	.00	.00	0.	*	2	0040	297	.00	.00	.00	0.
1	1215	148	.00	.00	.00	0.	*	2	0045	298	.00	.00	.00	0.
1	1220	149	.00	.00	.00	0.	*	2	0050	299	.00	.00	.00	0.
1	1225	150	.00	.00	.00	0.	*	2	0055	300	.00	.00	.00	0.
							*							

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*

TOTAL RAINFALL = 3.09, TOTAL LOSS = 1.31, TOTAL EXCESS = 1.78

	PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
				6-HR	24-HR	72-HR	24.92-HR
+	(CFS)	(HR)					
			(CFS)				
+	1776.	3.75		311.	78.	75.	75.
			(INCHES)	1.774	1.776	1.776	1.776
			(AC-FT)	154.	154.	154.	154.

CUMULATIVE AREA = 1.63 SQ MI

1

PEAK FLOW AND STAGE (END-OF-PERIOD) SUMMARY FOR MULTIPLE PLAN-RATIO ECONOMIC COMPUTATIONS
FLOWS IN CUBIC FEET PER SECOND, AREA IN SQUARE MILES
TIME TO PEAK IN HOURS

OPERATION	STATION	AREA	PLAN		RATIOS APPLIED TO PRECIPITATION RATIO 1 .90
HYDROGRAPH AT					
+	2	.54	1	FLOW	609.
				TIME	3.58
HYDROGRAPH AT					
+	3	.34	1	FLOW	439.
				TIME	3.58
HYDROGRAPH AT					
+	4	.53	1	FLOW	794.
				TIME	3.58
HYDROGRAPH AT					
+	5	1.43	1	FLOW	1521.
				TIME	3.83
HYDROGRAPH AT					
+	6	.20	1	FLOW	320.
				TIME	3.50
HYDROGRAPH AT					
+	7	.74	1	FLOW	1049.
				TIME	3.58
HYDROGRAPH AT					
+	8	.19	1	FLOW	308.
				TIME	3.50

HYDROGRAPH AT					
+	9	1.63	1	FLOW	1776.
				TIME	3.75

*** NORMAL END OF HEC-1 ***

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1****************************************
****************************************
 *                                      *
 *                                      *
 *   FLOOD HYDROGRAPH PACKAGE  (HEC-1)  *
 *                                      *
 *               JUN   1998             *
 *                                      *
 *            VERSION 4.1               *
 *                                      *
 *                                      *
 *                                      *
 *  RUN DATE   13NOV09  TIME  17:28:16  *
 *                                      *
 *                                      *
 *                                      *
 ****************************************
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U.S. ARMY CORPS OF ENGINEERS
HYDROLOGIC ENGINEERING CENTER
609 SECOND STREET
DAVIS, CALIFORNIA 95616
(916) 756-1104


```
X     X  XXXXXXX   XXXXX           X
X     X  X        X     X         XX
X     X  X        X                X
XXXXXXX  XXXX     X        XXXXX   X
X     X  X        X                X
X     X  X        X     X          X
X     X  XXXXXXX   XXXXX          XXX
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THIS PROGRAM REPLACES ALL PREVIOUS VERSIONS OF HEC-1 KNOWN AS HEC1 (JAN 73), HEC1GS, HEC1DB, AND HEC1KW.

THE DEFINITIONS OF VARIABLES -RTIMP- AND -RTIOR- HAVE CHANGED FROM THOSE USED WITH THE 1973-STYLE INPUT STRUCTURE.
THE DEFINITION OF -AMSKK- ON RM-CARD WAS CHANGED WITH REVISIONS DATED 28 SEP 81. THIS IS THE FORTRAN77 VERSION
NEW OPTIONS: DAMBREAK OUTFLOW SUBMERGENCE , SINGLE EVENT DAMAGE CALCULATION, DSS:WRITE STAGE FREQUENCY,
DSS:READ TIME SERIES AT DESIRED CALCULATION INTERVAL LOSS RATE:GREEN AND AMPT INFILTRATION
KINEMATIC WAVE: NEW FINITE DIFFERENCE ALGORITHM

1 HEC-1 INPUT PAGE 1

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          LINE          ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10
                        *DIAGRAM
 *** FREE ***
               1        ID
               2        ID
               3        ID
               4        ID   SILVER STATE PHOTOVOLTAIC POWER PROJECT
               5        ID
               6        ID
               7        ID   STORM 3 - SOUTHERN MOUNTAIN AREA BASIN 1
               8        ID
               9        ID   100-YEAR 6-HOUR STORM EVENT HEC-1 MODEL
              10        ID   SDN5 STORM DISTRIBUTION
              11        ID   OUTPUT FILE NAME: SS5100G.OUT
              12        ID
              13        ID
              14        ID
              15        ID   BASIN 1
              16        ID
              17        ID   SDN5
              18        ID
              19        ID     JR CARDS REPRESENT DEPTH AREA REDUCTION FACTORS (DARF) BASED ON THE
              20        ID        FOLLOWING VALUES:
              21        ID
              22        ID    AREA (SQUARE MILES)    DARF
              23        ID
              24        ID    17.2                   0.81
              25        ID
              26        IT       5       0       0     300
              27        IN       5       0       0
              28        IO       0
              29        JR    PREC    0.81
                        *
              30        KK       1
              31        BA    17.2
              32        PB    4.00
              33        PC   0.000   0.020   0.059   0.080   0.110   0.144   0.150   0.160   0.168   0.171
              34        PC   0.180   0.182   0.187   0.190   0.197   0.202   0.210   0.220   0.230   0.241
              35        PC   0.250   0.259   0.265   0.280   0.290   0.300   0.305   0.309   0.310   0.317
              36        PC   0.321   0.327   0.333   0.346   0.361   0.381   0.408   0.430   0.477   0.514
              37        PC   0.561   0.630   0.710   0.720   0.731   0.752   0.779   0.790   0.795   0.804
              38        PC   0.810   0.820   0.826   0.840   0.859   0.889   0.910   0.938   0.966   0.970
              39        PC   0.974   0.979   0.981   0.983   0.985   0.989   0.990   0.992   0.993   0.996
              40        PC   0.997   0.999   1.000
              41        LS       0    85.2
              42        UD   0.938
                        *
              43        ZZ
```

1 SCHEMATIC DIAGRAM OF STREAM NETWORK

INPUT LINE (V) ROUTING (---->) DIVERSION OR PUMP FLOW

NO. (.) CONNECTOR (<---) RETURN OF DIVERTED OR PUMPED FLOW

30 1

(***) RUNOFF ALSO COMPUTED AT THIS LOCATION

```
1****************************************
****************************************
 *                                      *                                      *
 *                                      *                                      *
 *   FLOOD HYDROGRAPH PACKAGE  (HEC-1)  *                                      *    U.S. ARMY CORPS OF ENGINEERS
 *                                      *                                      *
 *               JUN   1998             *                                      *    HYDROLOGIC ENGINEERING CENTER
 *                                      *                                      *
 *            VERSION 4.1               *                                      *          609 SECOND STREET
 *                                      *                                      *
 *                                      *                                      *       DAVIS, CALIFORNIA 95616
 *                                      *                                      *
 *  RUN DATE   13NOV09  TIME  17:28:16  *                                      *          (916) 756-1104
 *                                      *                                      *
 *                                      *                                      *
 ****************************************
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SILVER STATE PHOTOVOLTAIC POWER PROJECT

STORM 3 - SOUTHERN MOUNTAIN AREA BASIN 1

100-YEAR 6-HOUR STORM EVENT HEC-1 MODEL
SDN5 STORM DISTRIBUTION
OUTPUT FILE NAME: SS5100G.OUT

BASIN 1

SDN5

JR CARDS REPRESENT DEPTH AREA REDUCTION FACTORS (DARF) BASED ON THE FOLLOWING VALUES:

AREA (SQUARE MILES)	DARF
17.2	0.81

28 IO OUTPUT CONTROL VARIABLES

IPRNT	0	PRINT CONTROL
IPLOT	0	PLOT CONTROL
QSCAL	0.	HYDROGRAPH PLOT SCALE

IT HYDROGRAPH TIME DATA

NMIN	5	MINUTES IN COMPUTATION INTERVAL
IDATE	1 0	STARTING DATE
ITIME	0000	STARTING TIME
NQ	300	NUMBER OF HYDROGRAPH ORDINATES
NDDATE	2 0	ENDING DATE
NDTIME	0055	ENDING TIME
ICENT	19	CENTURY MARK

COMPUTATION INTERVAL .08 HOURS
TOTAL TIME BASE 24.92 HOURS

ENGLISH UNITS

DRAINAGE AREA	SQUARE MILES
PRECIPITATION DEPTH	INCHES
LENGTH, ELEVATION	FEET
FLOW	CUBIC FEET PER SECOND
STORAGE VOLUME	ACRE-FEET
SURFACE AREA	ACRES
TEMPERATURE	DEGREES FAHRENHEIT

JP MULTI-PLAN OPTION
NPLAN 1 NUMBER OF PLANS

JR MULTI-RATIO OPTION
RATIOS OF PRECIPITATION
.81

*** *** *** *

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27 IN          TIME DATA FOR INPUT TIME SERIES
                    JXMIN           5  TIME INTERVAL IN MINUTES
                   JXDATE       1   0  STARTING DATE
                   JXTIME           0  STARTING TIME

              SUBBASIN RUNOFF DATA

31 BA          SUBBASIN CHARACTERISTICS
                    TAREA       17.20  SUBBASIN AREA

               PRECIPITATION DATA

32 PB               STORM        4.00  BASIN TOTAL PRECIPITATION

33 PI            INCREMENTAL PRECIPITATION PATTERN
                   .02       .04       .02       .03       .03       .01       .01       .01       .00       .01
                   .00       .01       .00       .01       .01       .01       .01       .01       .01       .01
                   .01       .01       .02       .01       .01       .00       .00       .00       .01       .00
                   .01       .01       .01       .02       .02       .03       .02       .05       .04       .05
                   .07       .08       .01       .01       .02       .03       .01       .00       .01       .01
                   .01       .01       .01       .02       .03       .02       .03       .03       .00       .00
                   .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                   .00       .00

41 LS          SCS LOSS RATE
                    STRTL         .35  INITIAL ABSTRACTION
                   CRVNBR       85.20  CURVE NUMBER
                    RTIMP         .00  PERCENT IMPERVIOUS AREA

42 UD          SCS DIMENSIONLESS UNITGRAPH
                    TLAG         .94  LAG
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UNIT HYDROGRAPH
58 END-OF-PERIOD ORDINATES

216.	671.	1270.	2021.	2973.	4154.	5525.	6691.	7568.	8147.
8428.	8465.	8368.	7935.	7438.	6881.	6226.	5451.	4613.	3895.
3390.	2945.	2560.	2247.	1983.	1726.	1510.	1293.	1134.	989.
861.	752.	647.	567.	488.	427.	373.	324.	285.	245.
216.	187.	163.	142.	123.	108.	94.	85.	76.	68.
59.	50.	42.	34.	27.	20.	13.	6.		

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HYDROGRAPH AT STATION 1

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DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q	DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q
1		0000	1	.00	.00	.00	0.	1		1230	151	.00	.00	.00	0.
1		0005	2	.08	.08	.00	0.	1		1235	152	.00	.00	.00	0.
1		0010	3	.16	.16	.00	0.	1		1240	153	.00	.00	.00	0.
1		0015	4	.08	.08	.00	0.	1		1245	154	.00	.00	.00	0.
1		0020	5	.12	.12	.00	1.	1		1250	155	.00	.00	.00	0.
1		0025	6	.14	.11	.02	8.	1		1255	156	.00	.00	.00	0.
1		0030	7	.02	.02	.01	22.	1		1300	157	.00	.00	.00	0.
1		0035	8	.04	.03	.01	43.	1		1305	158	.00	.00	.00	0.
1		0040	9	.03	.02	.01	74.	1		1310	159	.00	.00	.00	0.
1		0045	10	.01	.01	.00	115.	1		1315	160	.00	.00	.00	0.
1		0050	11	.04	.02	.01	170.	1		1320	161	.00	.00	.00	0.
1		0055	12	.01	.01	.00	236.	1		1325	162	.00	.00	.00	0.
1		0100	13	.02	.01	.01	305.	1		1330	163	.00	.00	.00	0.
1		0105	14	.01	.01	.00	375.	1		1335	164	.00	.00	.00	0.
1		0110	15	.03	.02	.01	443.	1		1340	165	.00	.00	.00	0.
1		0115	16	.02	.01	.01	506.	1		1345	166	.00	.00	.00	0.
1		0120	17	.03	.02	.01	565.	1		1350	167	.00	.00	.00	0.
1		0125	18	.04	.02	.02	622.	1		1355	168	.00	.00	.00	0.
1		0130	19	.04	.02	.02	675.	1		1400	169	.00	.00	.00	0.
1		0135	20	.04	.02	.02	731.	1		1405	170	.00	.00	.00	0.
1		0140	21	.04	.02	.02	792.	1		1410	171	.00	.00	.00	0.
1		0145	22	.04	.02	.02	858.	1		1415	172	.00	.00	.00	0.
1		0150	23	.02	.01	.01	929.	1		1420	173	.00	.00	.00	0.
1		0155	24	.06	.03	.03	1009.	1		1425	174	.00	.00	.00	0.
1		0200	25	.04	.02	.02	1101.	1		1430	175	.00	.00	.00	0.
1		0205	26	.04	.02	.02	1203.	1		1435	176	.00	.00	.00	0.
1		0210	27	.02	.01	.01	1310.	1		1440	177	.00	.00	.00	0.
1		0215	28	.02	.01	.01	1416.	1		1445	178	.00	.00	.00	0.
1		0220	29	.00	.00	.00	1518.	1		1450	179	.00	.00	.00	0.
1		0225	30	.03	.01	.02	1616.	1		1455	180	.00	.00	.00	0.
1		0230	31	.02	.01	.01	1702.	1		1500	181	.00	.00	.00	0.
1		0235	32	.02	.01	.01	1770.	1		1505	182	.00	.00	.00	0.
1		0240	33	.02	.01	.01	1816.	1		1510	183	.00	.00	.00	0.
1		0245	34	.05	.02	.03	1846.	1		1515	184	.00	.00	.00	0.
1		0250	35	.06	.02	.04	1868.	1		1520	185	.00	.00	.00	0.
1		0255	36	.08	.03	.05	1897.	1		1525	186	.00	.00	.00	0.
1		0300	37	.11	.04	.07	1943.	1		1530	187	.00	.00	.00	0.
1		0305	38	.09	.03	.06	2024.	1		1535	188	.00	.00	.00	0.
1		0310	39	.19	.06	.13	2163.	1		1540	189	.00	.00	.00	0.
1		0315	40	.15	.04	.11	2384.	1		1545	190	.00	.00	.00	0.
1		0320	41	.19	.05	.14	2702.	1		1550	191	.00	.00	.00	0.
1		0325	42	.28	.06	.22	3147.	1		1555	192	.00	.00	.00	0.
1		0330	43	.32	.06	.26	3753.	1		1600	193	.00	.00	.00	0.

1	0335	44	.04	.01	.03	4499.	*	1	1605	194	.00	.00	.00	0.
1	0340	45	.04	.01	.04	5347.	*	1	1610	195	.00	.00	.00	0.
1	0345	46	.08	.01	.07	6272.	*	1	1615	196	.00	.00	.00	0.
1	0350	47	.11	.02	.09	7253.	*	1	1620	197	.00	.00	.00	0.
1	0355	48	.04	.01	.04	8237.	*	1	1625	198	.00	.00	.00	0.
1	0400	49	.02	.00	.02	9126.	*	1	1630	199	.00	.00	.00	0.
1	0405	50	.04	.01	.03	9817.	*	1	1635	200	.00	.00	.00	0.
1	0410	51	.02	.00	.02	10310.	*	1	1640	201	.00	.00	.00	0.
1	0415	52	.04	.01	.03	10603.	*	1	1645	202	.00	.00	.00	0.
1	0420	53	.02	.00	.02	10709.	*	1	1650	203	.00	.00	.00	0.
1	0425	54	.06	.01	.05	10641.	*	1	1655	204	.00	.00	.00	0.
1	0430	55	.08	.01	.07	10420.	*	1	1700	205	.00	.00	.00	0.
1	0435	56	.12	.02	.10	10077.	*	1	1705	206	.00	.00	.00	0.
1	0440	57	.08	.01	.07	9693.	*	1	1710	207	.00	.00	.00	0.
1	0445	58	.11	.01	.10	9301.	*	1	1715	208	.00	.00	.00	0.
1	0450	59	.11	.01	.10	8930.	*	1	1720	209	.00	.00	.00	0.
1	0455	60	.02	.00	.01	8596.	*	1	1725	210	.00	.00	.00	0.
1	0500	61	.02	.00	.01	8344.	*	1	1730	211	.00	.00	.00	0.
1	0505	62	.02	.00	.02	8204.	*	1	1735	212	.00	.00	.00	0.
1	0510	63	.01	.00	.01	8128.	*	1	1740	213	.00	.00	.00	0.
1	0515	64	.01	.00	.01	8052.	*	1	1745	214	.00	.00	.00	0.
1	0520	65	.01	.00	.01	7944.	*	1	1750	215	.00	.00	.00	0.
1	0525	66	.02	.00	.01	7783.	*	1	1755	216	.00	.00	.00	0.
1	0530	67	.00	.00	.00	7558.	*	1	1800	217	.00	.00	.00	0.
1	0535	68	.01	.00	.01	7260.	*	1	1805	218	.00	.00	.00	0.
1	0540	69	.00	.00	.00	6894.	*	1	1810	219	.00	.00	.00	0.
1	0545	70	.01	.00	.01	6488.	*	1	1815	220	.00	.00	.00	0.
1	0550	71	.00	.00	.00	6052.	*	1	1820	221	.00	.00	.00	0.
1	0555	72	.01	.00	.01	5582.	*	1	1825	222	.00	.00	.00	0.
1	0600	73	.00	.00	.00	5100.	*	1	1830	223	.00	.00	.00	0.
1	0605	74	.00	.00	.00	4620.	*	1	1835	224	.00	.00	.00	0.
1	0610	75	.00	.00	.00	4154.	*	1	1840	225	.00	.00	.00	0.
1	0615	76	.00	.00	.00	3719.	*	1	1845	226	.00	.00	.00	0.
1	0620	77	.00	.00	.00	3319.	*	1	1850	227	.00	.00	.00	0.
1	0625	78	.00	.00	.00	2971.	*	1	1855	228	.00	.00	.00	0.
1	0630	79	.00	.00	.00	2663.	*	1	1900	229	.00	.00	.00	0.
1	0635	80	.00	.00	.00	2382.	*	1	1905	230	.00	.00	.00	0.
1	0640	81	.00	.00	.00	2126.	*	1	1910	231	.00	.00	.00	0.
1	0645	82	.00	.00	.00	1894.	*	1	1915	232	.00	.00	.00	0.
1	0650	83	.00	.00	.00	1678.	*	1	1920	233	.00	.00	.00	0.
1	0655	84	.00	.00	.00	1481.	*	1	1925	234	.00	.00	.00	0.
1	0700	85	.00	.00	.00	1303.	*	1	1930	235	.00	.00	.00	0.
1	0705	86	.00	.00	.00	1143.	*	1	1935	236	.00	.00	.00	0.
1	0710	87	.00	.00	.00	1001.	*	1	1940	237	.00	.00	.00	0.
1	0715	88	.00	.00	.00	873.	*	1	1945	238	.00	.00	.00	0.
1	0720	89	.00	.00	.00	760.	*	1	1950	239	.00	.00	.00	0.
1	0725	90	.00	.00	.00	661.	*	1	1955	240	.00	.00	.00	0.
1	0730	91	.00	.00	.00	573.	*	1	2000	241	.00	.00	.00	0.
1	0735	92	.00	.00	.00	498.	*	1	2005	242	.00	.00	.00	0.
1	0740	93	.00	.00	.00	431.	*	1	2010	243	.00	.00	.00	0.
1	0745	94	.00	.00	.00	374.	*	1	2015	244	.00	.00	.00	0.
1	0750	95	.00	.00	.00	323.	*	1	2020	245	.00	.00	.00	0.
1	0755	96	.00	.00	.00	279.	*	1	2025	246	.00	.00	.00	0.
1	0800	97	.00	.00	.00	240.	*	1	2030	247	.00	.00	.00	0.
1	0805	98	.00	.00	.00	205.	*	1	2035	248	.00	.00	.00	0.
1	0810	99	.00	.00	.00	175.	*	1	2040	249	.00	.00	.00	0.
1	0815	100	.00	.00	.00	149.	*	1	2045	250	.00	.00	.00	0.
1	0820	101	.00	.00	.00	128.	*	1	2050	251	.00	.00	.00	0.
1	0825	102	.00	.00	.00	110.	*	1	2055	252	.00	.00	.00	0.
1	0830	103	.00	.00	.00	95.	*	1	2100	253	.00	.00	.00	0.
1	0835	104	.00	.00	.00	82.	*	1	2105	254	.00	.00	.00	0.
1	0840	105	.00	.00	.00	71.	*	1	2110	255	.00	.00	.00	0.
1	0845	106	.00	.00	.00	62.	*	1	2115	256	.00	.00	.00	0.
1	0850	107	.00	.00	.00	53.	*	1	2120	257	.00	.00	.00	0.
1	0855	108	.00	.00	.00	46.	*	1	2125	258	.00	.00	.00	0.
1	0900	109	.00	.00	.00	39.	*	1	2130	259	.00	.00	.00	0.
1	0905	110	.00	.00	.00	32.	*	1	2135	260	.00	.00	.00	0.
1	0910	111	.00	.00	.00	27.	*	1	2140	261	.00	.00	.00	0.
1	0915	112	.00	.00	.00	21.	*	1	2145	262	.00	.00	.00	0.
1	0920	113	.00	.00	.00	17.	*	1	2150	263	.00	.00	.00	0.
1	0925	114	.00	.00	.00	13.	*	1	2155	264	.00	.00	.00	0.
1	0930	115	.00	.00	.00	10.	*	1	2200	265	.00	.00	.00	0.
1	0935	116	.00	.00	.00	7.	*	1	2205	266	.00	.00	.00	0.
1	0940	117	.00	.00	.00	6.	*	1	2210	267	.00	.00	.00	0.
1	0945	118	.00	.00	.00	5.	*	1	2215	268	.00	.00	.00	0.
1	0950	119	.00	.00	.00	4.	*	1	2220	269	.00	.00	.00	0.
1	0955	120	.00	.00	.00	3.	*	1	2225	270	.00	.00	.00	0.
1	1000	121	.00	.00	.00	2.	*	1	2230	271	.00	.00	.00	0.
1	1005	122	.00	.00	.00	2.	*	1	2235	272	.00	.00	.00	0.
1	1010	123	.00	.00	.00	1.	*	1	2240	273	.00	.00	.00	0.
1	1015	124	.00	.00	.00	1.	*	1	2245	274	.00	.00	.00	0.
1	1020	125	.00	.00	.00	1.	*	1	2250	275	.00	.00	.00	0.
1	1025	126	.00	.00	.00	1.	*	1	2255	276	.00	.00	.00	0.
1	1030	127	.00	.00	.00	0.	*	1	2300	277	.00	.00	.00	0.
1	1035	128	.00	.00	.00	0.	*	1	2305	278	.00	.00	.00	0.
1	1040	129	.00	.00	.00	0.	*	1	2310	279	.00	.00	.00	0.
1	1045	130	.00	.00	.00	0.	*	1	2315	280	.00	.00	.00	0.
1	1050	131	.00	.00	.00	0.	*	1	2320	281	.00	.00	.00	0.
1	1055	132	.00	.00	.00	0.	*	1	2325	282	.00	.00	.00	0.
1	1100	133	.00	.00	.00	0.	*	1	2330	283	.00	.00	.00	0.
1	1105	134	.00	.00	.00	0.	*	1	2335	284	.00	.00	.00	0.
1	1110	135	.00	.00	.00	0.	*	1	2340	285	.00	.00	.00	0.
1	1115	136	.00	.00	.00	0.	*	1	2345	286	.00	.00	.00	0.
1	1120	137	.00	.00	.00	0.	*	1	2350	287	.00	.00	.00	0.
1	1125	138	.00	.00	.00	0.	*	1	2355	288	.00	.00	.00	0.
1	1130	139	.00	.00	.00	0.	*	2	0000	289	.00	.00	.00	0.
1	1135	140	.00	.00	.00	0.	*	2	0005	290	.00	.00	.00	0.
1	1140	141	.00	.00	.00	0.	*	2	0010	291	.00	.00	.00	0.
1	1145	142	.00	.00	.00	0.	*	2	0015	292	.00	.00	.00	0.

1	1150	143	.00	.00	.00	0.	*	2	0020	293	.00	.00	.00	0.
1	1155	144	.00	.00	.00	0.	*	2	0025	294	.00	.00	.00	0.
1	1200	145	.00	.00	.00	0.	*	2	0030	295	.00	.00	.00	0.
1	1205	146	.00	.00	.00	0.	*	2	0035	296	.00	.00	.00	0.
1	1210	147	.00	.00	.00	0.	*	2	0040	297	.00	.00	.00	0.
1	1215	148	.00	.00	.00	0.	*	2	0045	298	.00	.00	.00	0.
1	1220	149	.00	.00	.00	0.	*	2	0050	299	.00	.00	.00	0.
1	1225	150	.00	.00	.00	0.	*	2	0055	300	.00	.00	.00	0.

****

TOTAL RAINFALL = 4.00, TOTAL LOSS = 1.52, TOTAL EXCESS = 2.48

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.92-HR
+ (CFS)	(HR)					
		(CFS)				
+ 10709.	4.33		4474.	1145.	1103.	1103.
		(INCHES)	2.418	2.475	2.475	2.475
		(AC-FT)	2218.	2271.	2271.	2271.

CUMULATIVE AREA = 17.20 SQ MI

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HYDROGRAPH AT STATION 1
PLAN 1, RATIO = .81

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DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q	*	DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q
1		0000	1	.00	.00	.00	0.	*	1		1230	151	.00	.00	.00	0.
1		0005	2	.06	.06	.00	0.	*	1		1235	152	.00	.00	.00	0.
1		0010	3	.13	.13	.00	0.	*	1		1240	153	.00	.00	.00	0.
1		0015	4	.07	.07	.00	0.	*	1		1245	154	.00	.00	.00	0.
1		0020	5	.10	.10	.00	0.	*	1		1250	155	.00	.00	.00	0.
1		0025	6	.11	.10	.01	2.	*	1		1255	156	.00	.00	.00	0.
1		0030	7	.02	.02	.00	6.	*	1		1300	157	.00	.00	.00	0.
1		0035	8	.03	.03	.01	13.	*	1		1305	158	.00	.00	.00	0.
1		0040	9	.03	.02	.00	23.	*	1		1310	159	.00	.00	.00	0.
1		0045	10	.01	.01	.00	38.	*	1		1315	160	.00	.00	.00	0.
1		0050	11	.03	.02	.01	58.	*	1		1320	161	.00	.00	.00	0.
1		0055	12	.01	.01	.00	85.	*	1		1325	162	.00	.00	.00	0.
1		0100	13	.02	.01	.00	114.	*	1		1330	163	.00	.00	.00	0.
1		0105	14	.01	.01	.00	146.	*	1		1335	164	.00	.00	.00	0.
1		0110	15	.02	.02	.01	179.	*	1		1340	165	.00	.00	.00	0.
1		0115	16	.02	.01	.00	212.	*	1		1345	166	.00	.00	.00	0.
1		0120	17	.03	.02	.01	245.	*	1		1350	167	.00	.00	.00	0.
1		0125	18	.03	.02	.01	279.	*	1		1355	168	.00	.00	.00	0.
1		0130	19	.03	.02	.01	313.	*	1		1400	169	.00	.00	.00	0.
1		0135	20	.04	.02	.01	352.	*	1		1405	170	.00	.00	.00	0.
1		0140	21	.03	.02	.01	394.	*	1		1410	171	.00	.00	.00	0.
1		0145	22	.03	.02	.01	442.	*	1		1415	172	.00	.00	.00	0.
1		0150	23	.02	.01	.01	495.	*	1		1420	173	.00	.00	.00	0.
1		0155	24	.05	.03	.02	554.	*	1		1425	174	.00	.00	.00	0.
1		0200	25	.03	.02	.01	621.	*	1		1430	175	.00	.00	.00	0.
1		0205	26	.03	.02	.01	695.	*	1		1435	176	.00	.00	.00	0.
1		0210	27	.02	.01	.01	772.	*	1		1440	177	.00	.00	.00	0.
1		0215	28	.01	.01	.01	849.	*	1		1445	178	.00	.00	.00	0.
1		0220	29	.00	.00	.00	923.	*	1		1450	179	.00	.00	.00	0.
1		0225	30	.02	.01	.01	995.	*	1		1455	180	.00	.00	.00	0.
1		0230	31	.01	.01	.01	1059.	*	1		1500	181	.00	.00	.00	0.
1		0235	32	.02	.01	.01	1113.	*	1		1505	182	.00	.00	.00	0.
1		0240	33	.02	.01	.01	1151.	*	1		1510	183	.00	.00	.00	0.
1		0245	34	.04	.02	.02	1179.	*	1		1515	184	.00	.00	.00	0.
1		0250	35	.05	.02	.03	1201.	*	1		1520	185	.00	.00	.00	0.
1		0255	36	.06	.03	.04	1229.	*	1		1525	186	.00	.00	.00	0.
1		0300	37	.09	.04	.05	1270.	*	1		1530	187	.00	.00	.00	0.
1		0305	38	.07	.03	.04	1334.	*	1		1535	188	.00	.00	.00	0.
1		0310	39	.15	.06	.10	1441.	*	1		1540	189	.00	.00	.00	0.
1		0315	40	.12	.04	.08	1606.	*	1		1545	190	.00	.00	.00	0.
1		0320	41	.15	.05	.11	1841.	*	1		1550	191	.00	.00	.00	0.
1		0325	42	.22	.06	.16	2170.	*	1		1555	192	.00	.00	.00	0.
1		0330	43	.26	.06	.20	2619.	*	1		1600	193	.00	.00	.00	0.
1		0335	44	.03	.01	.03	3173.	*	1		1605	194	.00	.00	.00	0.
1		0340	45	.04	.01	.03	3805.	*	1		1610	195	.00	.00	.00	0.
1		0345	46	.07	.01	.05	4496.	*	1		1615	196	.00	.00	.00	0.
1		0350	47	.09	.02	.07	5234.	*	1		1620	197	.00	.00	.00	0.
1		0355	48	.04	.01	.03	5978.	*	1		1625	198	.00	.00	.00	0.
1		0400	49	.02	.00	.01	6655.	*	1		1630	199	.00	.00	.00	0.
1		0405	50	.03	.01	.02	7187.	*	1		1635	200	.00	.00	.00	0.
1		0410	51	.02	.00	.02	7573.	*	1		1640	201	.00	.00	.00	0.
1		0415	52	.03	.01	.03	7812.	*	1		1645	202	.00	.00	.00	0.
1		0420	53	.02	.00	.02	7911.	*	1		1650	203	.00	.00	.00	0.
1		0425	54	.05	.01	.04	7880.	*	1		1655	204	.00	.00	.00	0.
1		0430	55	.06	.01	.05	7735.	*	1		1700	205	.00	.00	.00	0.
1		0435	56	.10	.02	.08	7497.	*	1		1705	206	.00	.00	.00	0.
1		0440	57	.07	.01	.06	7227.	*	1		1710	207	.00	.00	.00	0.
1		0445	58	.09	.01	.08	6951.	*	1		1715	208	.00	.00	.00	0.
1		0450	59	.09	.01	.08	6691.	*	1		1720	209	.00	.00	.00	0.
1		0455	60	.01	.00	.01	6457.	*	1		1725	210	.00	.00	.00	0.

1	0500	61	.01	.00	.01	6283.	*	1	1730	211	.00	.00	.00	0.
1	0505	62	.02	.00	.01	6194.	*	1	1735	212	.00	.00	.00	0.
1	0510	63	.01	.00	.01	6152.	*	1	1740	213	.00	.00	.00	0.
1	0515	64	.01	.00	.01	6109.	*	1	1745	214	.00	.00	.00	0.
1	0520	65	.01	.00	.01	6039.	*	1	1750	215	.00	.00	.00	0.
1	0525	66	.01	.00	.01	5927.	*	1	1755	216	.00	.00	.00	0.
1	0530	67	.00	.00	.00	5764.	*	1	1800	217	.00	.00	.00	0.
1	0535	68	.01	.00	.01	5543.	*	1	1805	218	.00	.00	.00	0.
1	0540	69	.00	.00	.00	5269.	*	1	1810	219	.00	.00	.00	0.
1	0545	70	.01	.00	.01	4964.	*	1	1815	220	.00	.00	.00	0.
1	0550	71	.00	.00	.00	4634.	*	1	1820	221	.00	.00	.00	0.
1	0555	72	.01	.00	.01	4276.	*	1	1825	222	.00	.00	.00	0.
1	0600	73	.00	.00	.00	3909.	*	1	1830	223	.00	.00	.00	0.
1	0605	74	.00	.00	.00	3543.	*	1	1835	224	.00	.00	.00	0.
1	0610	75	.00	.00	.00	3187.	*	1	1840	225	.00	.00	.00	0.
1	0615	76	.00	.00	.00	2854.	*	1	1845	226	.00	.00	.00	0.
1	0620	77	.00	.00	.00	2548.	*	1	1850	227	.00	.00	.00	0.
1	0625	78	.00	.00	.00	2282.	*	1	1855	228	.00	.00	.00	0.
1	0630	79	.00	.00	.00	2046.	*	1	1900	229	.00	.00	.00	0.
1	0635	80	.00	.00	.00	1831.	*	1	1905	230	.00	.00	.00	0.
1	0640	81	.00	.00	.00	1634.	*	1	1910	231	.00	.00	.00	0.
1	0645	82	.00	.00	.00	1456.	*	1	1915	232	.00	.00	.00	0.
1	0650	83	.00	.00	.00	1291.	*	1	1920	233	.00	.00	.00	0.
1	0655	84	.00	.00	.00	1139.	*	1	1925	234	.00	.00	.00	0.
1	0700	85	.00	.00	.00	1002.	*	1	1930	235	.00	.00	.00	0.
1	0705	86	.00	.00	.00	879.	*	1	1935	236	.00	.00	.00	0.
1	0710	87	.00	.00	.00	770.	*	1	1940	237	.00	.00	.00	0.
1	0715	88	.00	.00	.00	672.	*	1	1945	238	.00	.00	.00	0.
1	0720	89	.00	.00	.00	584.	*	1	1950	239	.00	.00	.00	0.
1	0725	90	.00	.00	.00	508.	*	1	1955	240	.00	.00	.00	0.
1	0730	91	.00	.00	.00	441.	*	1	2000	241	.00	.00	.00	0.
1	0735	92	.00	.00	.00	383.	*	1	2005	242	.00	.00	.00	0.
1	0740	93	.00	.00	.00	332.	*	1	2010	243	.00	.00	.00	0.
1	0745	94	.00	.00	.00	288.	*	1	2015	244	.00	.00	.00	0.
1	0750	95	.00	.00	.00	249.	*	1	2020	245	.00	.00	.00	0.
1	0755	96	.00	.00	.00	215.	*	1	2025	246	.00	.00	.00	0.
1	0800	97	.00	.00	.00	185.	*	1	2030	247	.00	.00	.00	0.
1	0805	98	.00	.00	.00	158.	*	1	2035	248	.00	.00	.00	0.
1	0810	99	.00	.00	.00	135.	*	1	2040	249	.00	.00	.00	0.
1	0815	100	.00	.00	.00	115.	*	1	2045	250	.00	.00	.00	0.
1	0820	101	.00	.00	.00	99.	*	1	2050	251	.00	.00	.00	0.
1	0825	102	.00	.00	.00	85.	*	1	2055	252	.00	.00	.00	0.
1	0830	103	.00	.00	.00	74.	*	1	2100	253	.00	.00	.00	0.
1	0835	104	.00	.00	.00	64.	*	1	2105	254	.00	.00	.00	0.
1	0840	105	.00	.00	.00	55.	*	1	2110	255	.00	.00	.00	0.
1	0845	106	.00	.00	.00	48.	*	1	2115	256	.00	.00	.00	0.
1	0850	107	.00	.00	.00	41.	*	1	2120	257	.00	.00	.00	0.
1	0855	108	.00	.00	.00	35.	*	1	2125	258	.00	.00	.00	0.
1	0900	109	.00	.00	.00	30.	*	1	2130	259	.00	.00	.00	0.
1	0905	110	.00	.00	.00	25.	*	1	2135	260	.00	.00	.00	0.
1	0910	111	.00	.00	.00	21.	*	1	2140	261	.00	.00	.00	0.
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1	0920	113	.00	.00	.00	13.	*	1	2150	263	.00	.00	.00	0.
1	0925	114	.00	.00	.00	10.	*	1	2155	264	.00	.00	.00	0.
1	0930	115	.00	.00	.00	7.	*	1	2200	265	.00	.00	.00	0.
1	0935	116	.00	.00	.00	6.	*	1	2205	266	.00	.00	.00	0.
1	0940	117	.00	.00	.00	4.	*	1	2210	267	.00	.00	.00	0.
1	0945	118	.00	.00	.00	4.	*	1	2215	268	.00	.00	.00	0.
1	0950	119	.00	.00	.00	3.	*	1	2220	269	.00	.00	.00	0.
1	0955	120	.00	.00	.00	2.	*	1	2225	270	.00	.00	.00	0.
1	1000	121	.00	.00	.00	2.	*	1	2230	271	.00	.00	.00	0.
1	1005	122	.00	.00	.00	1.	*	1	2235	272	.00	.00	.00	0.
1	1010	123	.00	.00	.00	1.	*	1	2240	273	.00	.00	.00	0.
1	1015	124	.00	.00	.00	1.	*	1	2245	274	.00	.00	.00	0.
1	1020	125	.00	.00	.00	1.	*	1	2250	275	.00	.00	.00	0.
1	1025	126	.00	.00	.00	0.	*	1	2255	276	.00	.00	.00	0.
1	1030	127	.00	.00	.00	0.	*	1	2300	277	.00	.00	.00	0.
1	1035	128	.00	.00	.00	0.	*	1	2305	278	.00	.00	.00	0.
1	1040	129	.00	.00	.00	0.	*	1	2310	279	.00	.00	.00	0.
1	1045	130	.00	.00	.00	0.	*	1	2315	280	.00	.00	.00	0.
1	1050	131	.00	.00	.00	0.	*	1	2320	281	.00	.00	.00	0.
1	1055	132	.00	.00	.00	0.	*	1	2325	282	.00	.00	.00	0.
1	1100	133	.00	.00	.00	0.	*	1	2330	283	.00	.00	.00	0.
1	1105	134	.00	.00	.00	0.	*	1	2335	284	.00	.00	.00	0.
1	1110	135	.00	.00	.00	0.	*	1	2340	285	.00	.00	.00	0.
1	1115	136	.00	.00	.00	0.	*	1	2345	286	.00	.00	.00	0.
1	1120	137	.00	.00	.00	0.	*	1	2350	287	.00	.00	.00	0.
1	1125	138	.00	.00	.00	0.	*	1	2355	288	.00	.00	.00	0.
1	1130	139	.00	.00	.00	0.	*	2	0000	289	.00	.00	.00	0.
1	1135	140	.00	.00	.00	0.	*	2	0005	290	.00	.00	.00	0.
1	1140	141	.00	.00	.00	0.	*	2	0010	291	.00	.00	.00	0.
1	1145	142	.00	.00	.00	0.	*	2	0015	292	.00	.00	.00	0.
1	1150	143	.00	.00	.00	0.	*	2	0020	293	.00	.00	.00	0.
1	1155	144	.00	.00	.00	0.	*	2	0025	294	.00	.00	.00	0.
1	1200	145	.00	.00	.00	0.	*	2	0030	295	.00	.00	.00	0.
1	1205	146	.00	.00	.00	0.	*	2	0035	296	.00	.00	.00	0.
1	1210	147	.00	.00	.00	0.	*	2	0040	297	.00	.00	.00	0.
1	1215	148	.00	.00	.00	0.	*	2	0045	298	.00	.00	.00	0.
1	1220	149	.00	.00	.00	0.	*	2	0050	299	.00	.00	.00	0.
1	1225	150	.00	.00	.00	0.	*	2	0055	300	.00	.00	.00	0.
							*							

****

TOTAL RAINFALL = 3.24, TOTAL LOSS = 1.43, TOTAL EXCESS = 1.81

PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW			
		6-HR	24-HR	72-HR	24.92-HR

+	(CFS)	(HR)				
			(CFS)			
+	7911.	4.33		3282.	836.	805.	805.
			(INCHES)	1.774	1.807	1.807	1.807
			(AC-FT)	1628.	1658.	1658.	1658.

CUMULATIVE AREA = 17.20 SQ MI

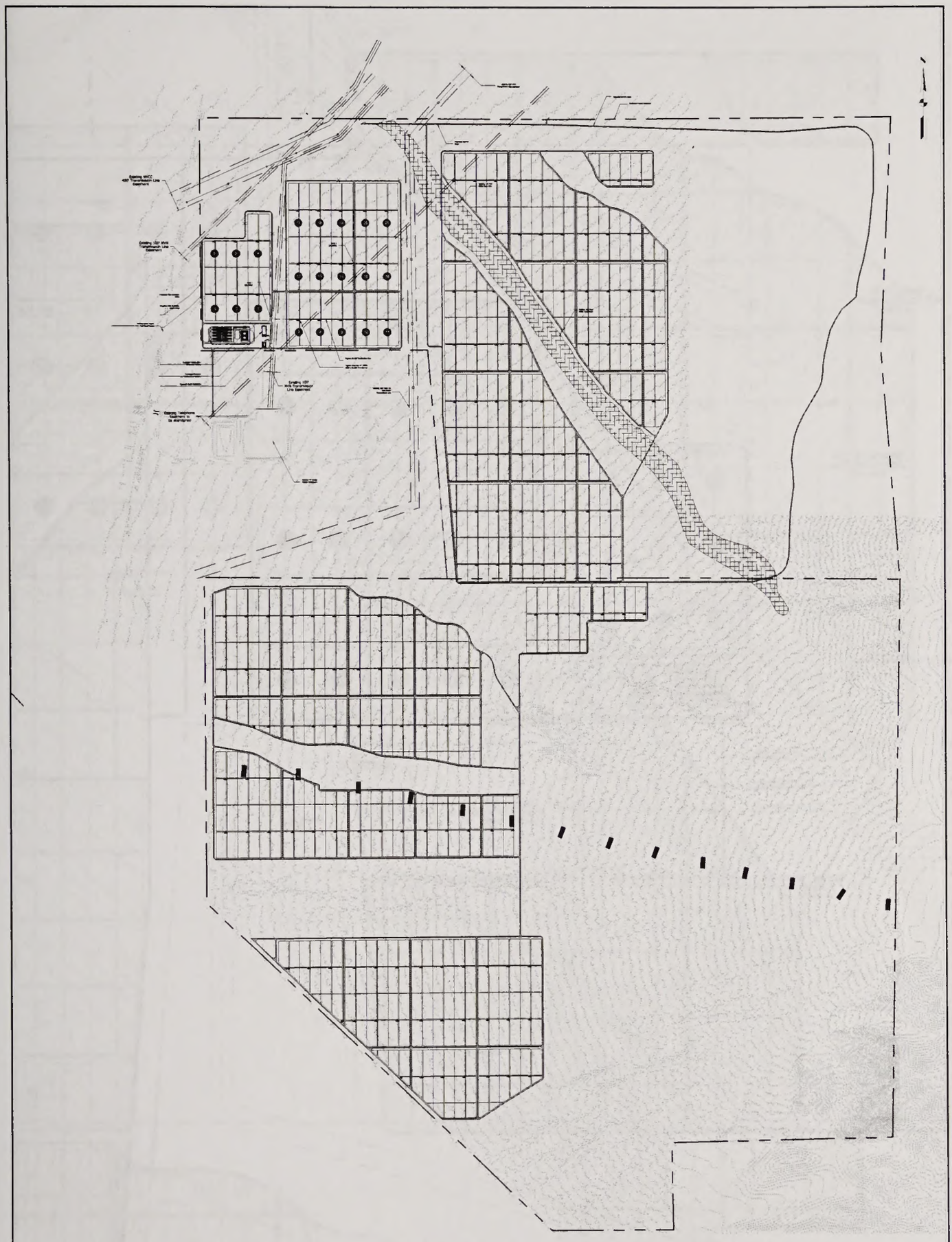
1

PEAK FLOW AND STAGE (END-OF-PERIOD) SUMMARY FOR MULTIPLE PLAN-RATIO ECONOMIC COMPUTATIONS
FLOWS IN CUBIC FEET PER SECOND, AREA IN SQUARE MILES
TIME TO PEAK IN HOURS

					RATIOS APPLIED TO PRECIPITATION
OPERATION	STATION	AREA	PLAN		RATIO 1
					.81
HYDROGRAPH AT					
+	1	17.20	1	FLOW	7911.
				TIME	4.33

*** NORMAL END OF HEC-1 ***

APPENDIX B
CONCEPTUAL CONTOUR PLAN



SILVER STATE SOLAR
PRIMM VALLEY, CLARK COUNTY NV

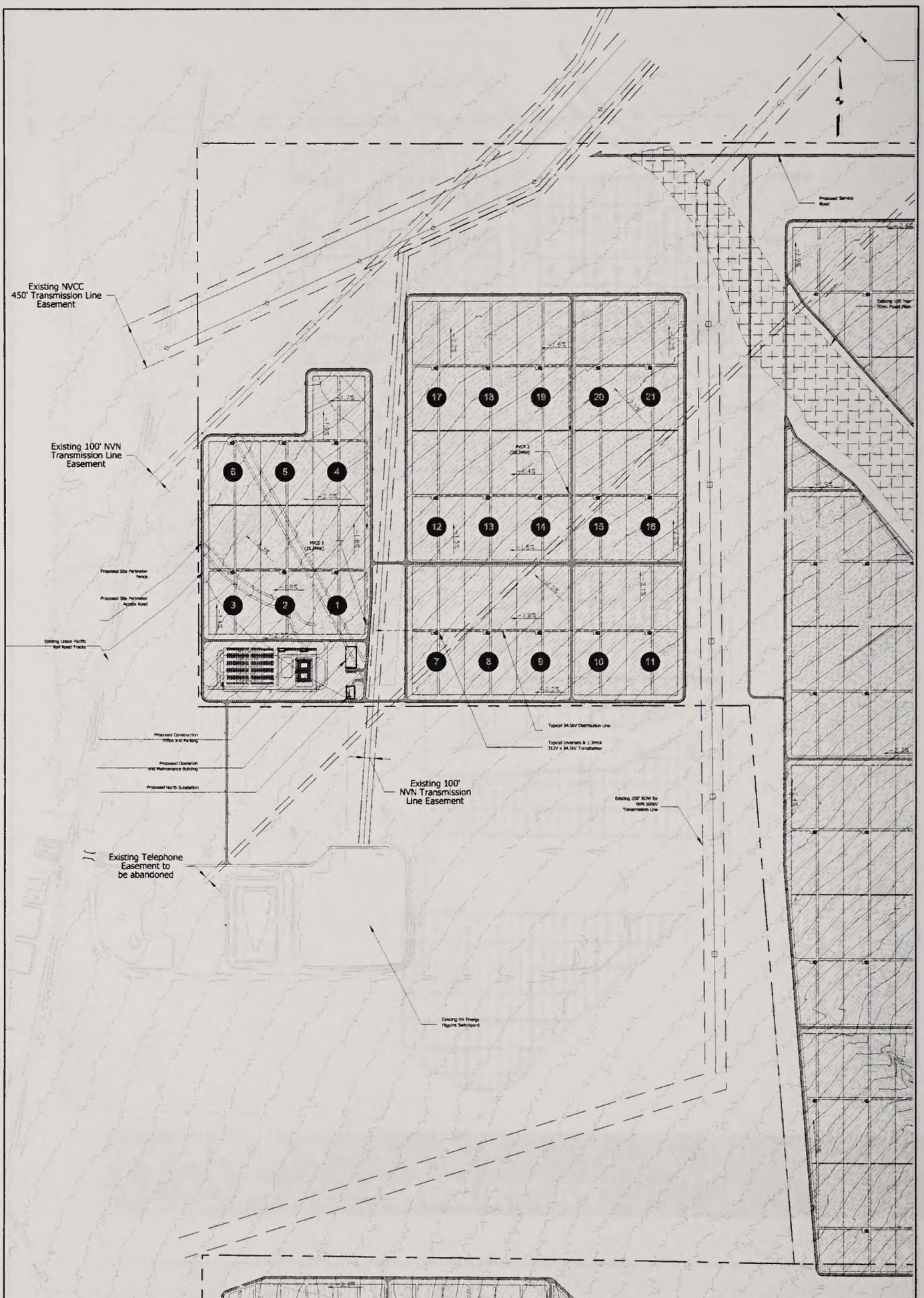
CONCEPTUAL CONTOUR PLAN

THE Louis Berger Group, INC.
500 AMIGO COURT, SUITE 100 • LAS VEGAS, NEVADA • 89119
PHONE (702) 736-8532 FAX (702) 736-0704

1"=800'
NONE

REVISIONS

NO.	DATE	DESCRIPTION	APPD.



SILVER STATE SOLAR
PRIMM VALLEY, CLARK COUNTY NV

CONCEPTUAL CONTOUR PLAN

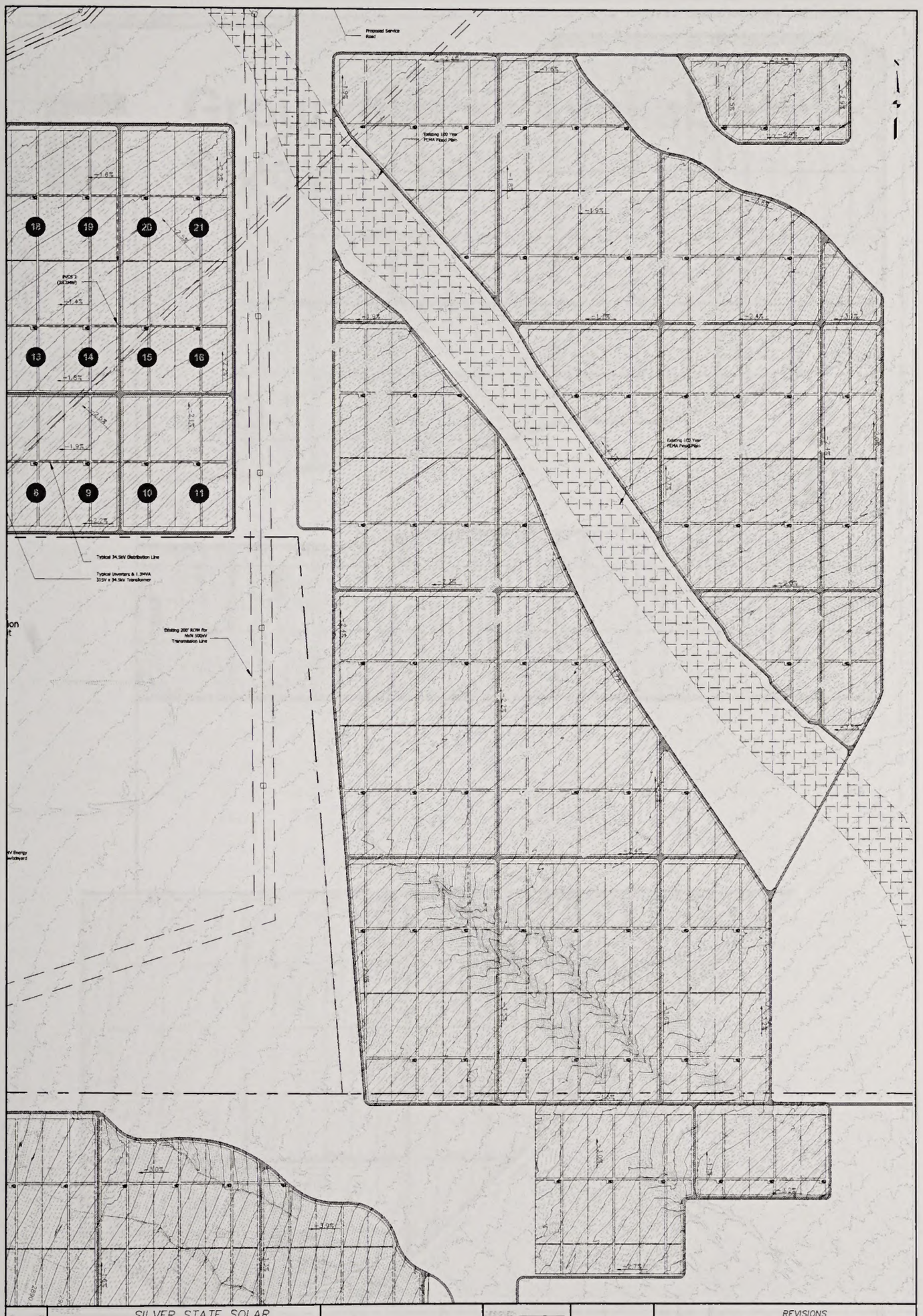
2

THE Louis Berger Group, INC.
500 AMIGO COURT, SUITE 100 • LAS VEGAS, NEVADA • 89119
PHONE (702) 736-8630 • FAX (702) 736-0704

DESIGNED
DRAWN
CHECKED
SCALE 1"=400'
DATE NONE

REVISIONS

NO.	DATE	DESCRIPTION	APPD.



SILVER STATE SOLAR
PRIMM VALLEY, CLARK COUNTY NV

CONCEPTUAL CONTOUR PLAN

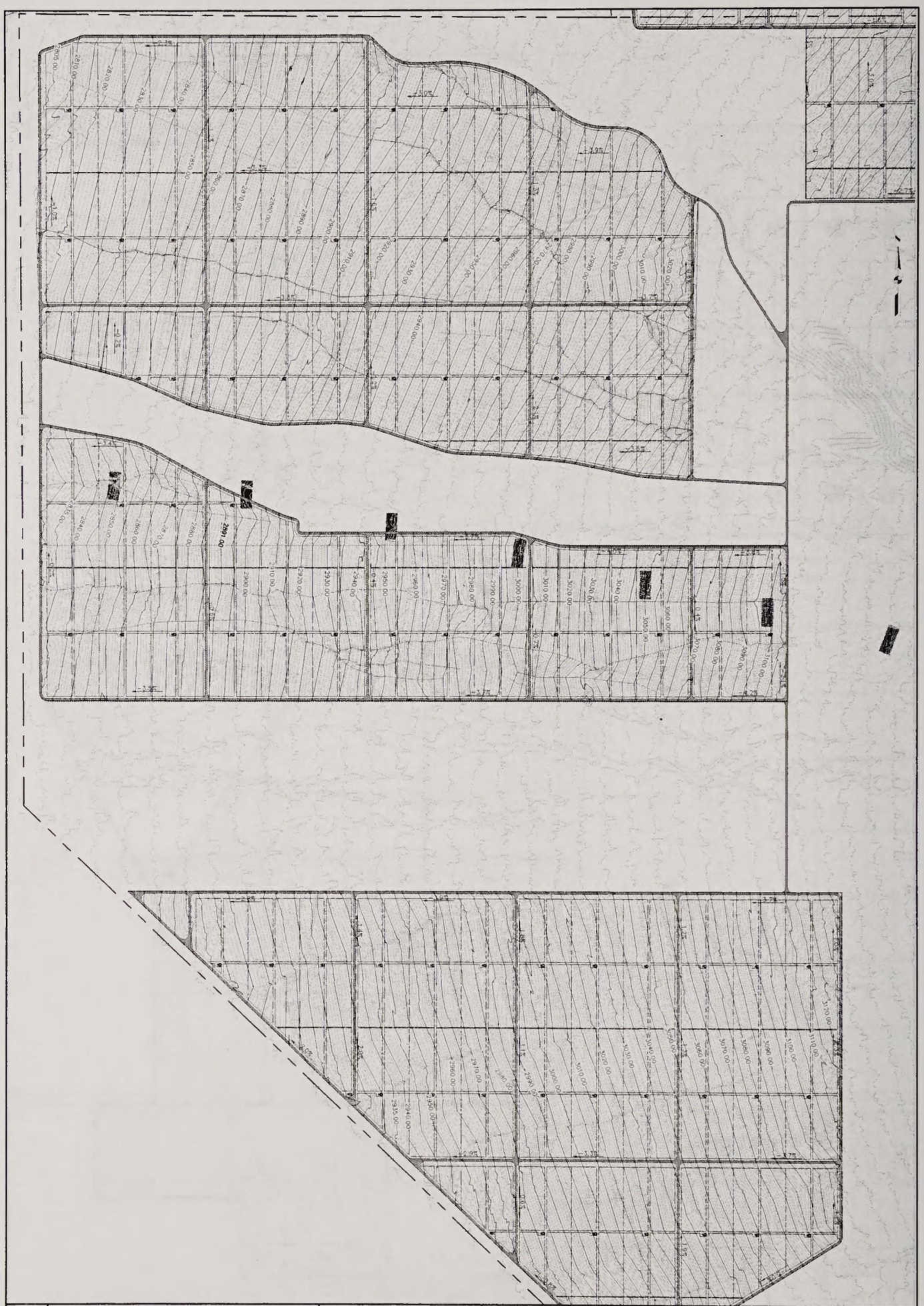
3

THE Louis Berger Group, INC.
300 Aaron Court, Suite 100 • Las Vegas, Nevada • 89119
PHONE (702) 736-8822 FAX (702) 736-0704

DESIGNED
DRAWN
CHECKED
DATE
SCALE 1"=400'
SHEET NONE

REVISIONS

NO.	DATE	DESCRIPTION	APPD.



SILVER STATE SOLAR
PRIMM VALLEY, CLARK COUNTY NV

CONCEPTUAL CONTOUR PLAN

THE Louis Berger Group, INC.
500 AMIGO COURT, SUITE 100 • LAS VEGAS, NEVADA • 89119
PHONE (702) 736-4633 FAX (702) 736-0704

1"=400'
NONE

REVISIONS

NO.	DATE	DESCRIPTION	APPD.

4

E Groundwater Availability Study

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TECHNICAL MEMORANDUM

Date: August 9, 2010

To: Jackson Moore
First Solar

Reviewed By: Kenneth Loy
P.G. 7008

From: Barrett Kaasa
Timothy Durbin
West Yost Associates

Project No: 367-00-10-02

Subject: First Solar Silver State – Groundwater Availability

1.0 Proposed Solar Electric Project

First Solar proposes to construct a solar power project within the Mojave Desert region of Nevada. A groundwater supply is required during the construction and operation of the project. During the four-year construction period, the water requirement may be about 200 acre-ft/yr, which is equivalent to continuously pumping at 125 gal/min. During the project operational period, the water requirement will be about 20 acre-ft/yr, which is equivalent to continuous pumping at 12.5 gal/min.

The peak instantaneous demand during construction could be as high as 500 gal/min. The peak demand corresponds to filling water trucks periodically during a day. However, the instantaneous groundwater draw will be reduced by pumping groundwater to a pond, and then filling trucks from the pond. The pond will have a volume of about 1 to 3 million gallons. The peak daily demand from the pond could be as much as 550,000 gal, but the normal daily demand will be about 200,000 gal. Were the peak daily demand to persist for 10 days, the demand can be satisfied with groundwater pumping rates of 175 to 315 gal/min, depending on the size of the storage pond. While such an extended demand is unlikely, it defines an upper bound to the required groundwater-pumping capacity.

The purpose of this memorandum is to describe the physical availability of groundwater within the project site to satisfy these water demands, and to evaluate the effect of the groundwater pumping on nearby wells. The effect of project pumping on existing water-supply wells was evaluated. Those are wells at the Nevada Energy Goodsprings facility (Figure 1), the Primm Valley Resort (Figure 2), the Primm Golf Course (Figure 2), and the Nevada Energy Higgins facility (Figure 2). The assessment of availability and effects was developed based on only the readily available data.

2.0 Description of Region Surrounding Project Site

2.1 Physiographic Setting

Ivanpah Valley is located on the California-Nevada border (Figure 1), about 40 miles southwest of Las Vegas. The valley covers about 560,000 acres, including 340,000 acres within California and 220,000 acres within Nevada, including Jean Lake Valley. The California part of Ivanpah Valley is referred to in this report as south Ivanpah Valley. The Nevada part of Ivanpah Valley and Jean Lake Valley are referred to as north Ivanpah Valley.

Ivanpah Valley is a topographically closed basin within which surface-water drainage evaporates on either the Ivanpah Lake or Roach Lake playas. The basin is a northward trending physiographic feature bordered by the Bird Spring Range on the north; the Sheep Mountains, Lucy Grey Range, and New York Mountains on the east; the Spring Mountains, Clark Mountain Range, and Ivanpah Mountains on the west; and by a low topographic divide between Ivanpah Valley and Shadow Valley. Topographic altitudes range from about 2,600 ft on the playas to about 7,200 ft within the eastern mountains and 8,500 ft within the western mountains.

2.2 Geologic Setting

The most complete geologic mapping of Ivanpah Valley and adjacent areas was done by Hewett (1956). That mapping includes consolidated rocks and unconsolidated deposits. The consolidated rocks include carbonate, intrusive, and extrusive rocks. The unconsolidated deposits are alluvial deposits. Figure 1 shows the surface exposures of the consolidated rocks and unconsolidated deposits. The unconsolidated deposits are underlain and bounded by the consolidated rocks. The consolidated rocks are underlain by a basement of silicate metamorphic rocks.

2.2.1 Consolidated Rocks

The consolidated rocks represent units ranging from pre-Cambrian to Tertiary age (Hewett, 1956; Plume, 1996; Harrill and Prudic, 1998). The carbonate rocks include limestone and dolomite of pre-Cambrian and Paleozoic age. They occur within the Spring Mountains, Bird Spring Range, and Sheep Mountains on the northwestern and northeastern boarders of Ivanpah Valley. The intrusive rocks are mostly granitic rocks of pre-Cambrian and Tertiary ages. They occur within the McCullough Range, New York Mountains, Clark Mountain Range, and Ivanpah Mountains on the southeastern and southwestern borders. The extrusive rocks are mostly basaltic rocks of Tertiary and Quaternary age. These rocks occur within the McCullough Range on the western border of Jean Lake Valley.

The hydraulic properties of the consolidated rocks vary greatly among the rock types (Plume, 1996; Harrill and Prudic, 1998). The carbonate rocks are most permeable at large length scales. While the carbonate-rock matrix is poorly permeable, fault-induced and

fold-induced significant fracture permeability is sufficient. Correspondingly, groundwater underflow can occur through carbonate-rock mountain ranges where supporting hydraulic gradients exist. The granitic and basaltic rocks are poorly permeable at large scales. While those rocks are fractured, poor fracture connectivity and small apertures at depth limit the ability to transmit water. Correspondingly, no groundwater underflow occurs through the non-carbonate-rock mountain ranges, and those ranges act as barriers to underflow.

2.2.2 Unconsolidated Deposits

The unconsolidated deposits consist of alluvial and playa deposits of Pliocene to Holocene ages (Hewett, 1956; Plume, 1996). An older alluvium, which represents alluvial-fan deposits of Pliocene and early Pleistocene ages, is composed of gravel, sand, and silt with some boulders and clay. This unit underlies the valley-floor areas within both Ivanpah Valley and Jean Lake Valley. The older alluvium is generally below the regional groundwater table, and produces good yields to production wells. The younger alluvium, which represents alluvial-fan deposits of late Pleistocene and Holocene ages, is composed of gravel and sand with some silt and clay. The younger alluvium is generally above the regional groundwater table, and only perched groundwater occurs. The playa deposits, which represent pluvial deposits of Holocene age, are composed of fine sand, silt, and clay. The playa deposits are above the regional groundwater table, and only perched groundwater occurs.

2.2.3 Structural Features

Extensive faulting occurs within Ivanpah Valley and adjacent areas (Hewett, 1956). The faulting consists most prominently of thrusts, but notable normal faults also occur (Figure 1). Thrust faulting occurred episodically during the Mesozoic era, which resulted in deformation of the carbonate and pre-Cambrian granitic rocks. Significant normal faulting occurred starting in the Tertiary period, which has produced deformation in the basalts and Tertiary granitic rocks. Furthermore, the normal faulting produced the down-dropped structural basins that now are filled with the unconsolidated deposits.

As a general proposition, faults can impact groundwater flow. Thrusts within consolidated rocks tend to impede transverse groundwater flow. Normal faults in either consolidated rocks or unconsolidated deposits also tend to impede transverse groundwater flow. However, normal faults in consolidated rocks can act as conduits for longitudinal groundwater flow, even when they simultaneously act as impediments to transverse groundwater flow.

The principal thrusts within Ivanpah Valley are the Mesquite, Keystone, and Contact thrusts. The Mesquite Thrust brings older carbonate rocks over younger carbonate rocks within the Clark Mountain Range and Ivanpah Mountains. South of the Ivanpah Fault, the thrust plane is nearly horizontal, is above the regional groundwater table, and can have no impact on regional groundwater flow. North of the Ivanpah Fault, however, the thrust plane dips northwestward, intersects the regional groundwater table, and probably

impedes groundwater underflow from Ivanpah Valley through the Clark Mountain Range into Mesquite Valley. The Keystone and Contact thrusts likewise bring older carbonate rocks over younger carbonate rocks. The thrust planes dip toward the west, intersect the regional groundwater table, and probably impede groundwater underflow from Ivanpah Valley through the Spring Mountains into Mesquite Valley.

The principal normal faults are Stateline, Ivanpah, Roach, and McCullough faults. The Stateline fault is downdropped on its southwest side, the Ivanpah Fault is downdropped on its northeast side, and the McCullough fault is downdropped on its west side. These displacements produced a southeastward trending structural basin between the Ivanpah and Stateline faults, which deepens toward the southeast. The trough correspondingly is filled with unconsolidated deposits that probably are at least several thousand feet in thickness. The Roach Fault is downdropped on its west side. This displacement produced a northward trending structural basin that deepens eastward. However, the depth of the basin, and the corresponding thickness of the unconsolidated deposits, is less than for the structural basin between the Ivanpah and Stateline faults.

2.3 Hydrologic Setting

Groundwater recharge occurs from precipitation on the mountains surrounding Ivanpah and Jean Lake valleys. While the valley-floor precipitation tends to be consumed entirely by evapotranspiration processes, the mountain precipitation produces runoff and deep infiltration. Runoff produces recharge by streambed infiltration, mostly on the alluvial fans that border the mountains. Deep infiltration produces recharge by groundwater flow through the mountain mass into the unconsolidated deposits. For the carbonate terrains, deep infiltration tends to be the dominant process, which coincides with the underdeveloped stream-channel networks within the carbonate terrains. For the granitic and basaltic terrains, streambed infiltration tends to be the dominant process, which coincides with the occurrence of dense stream-channel networks. These processes together produce recharge along the margins of the unconsolidated deposits.

The recharged groundwater flows northward because of geologic controls that prevent or impede westward or eastward groundwater flow. Granitic and basaltic rock within the McCullough Range and New York Mountains prevent groundwater flow between Ivanpah Valley and the adjacent Lanfair or Piute valleys. Granitic rocks occur within the Ivanpah Mountains and Clark Mountain Range between Ivanpah Valley and Shadow and Mesquite valleys. Westward dipping thrusts within the Clark Mountain Range and Spring Mountains impede groundwater flow between Ivanpah Valley and Mesquite Valley. However, the carbonate rocks within the Bird Spring Range and the northward trending structural texture allows groundwater flow between Ivanpah Valley and Las Vegas Valley. Concomitantly, the groundwater recharge within Ivanpah and Jean Lake valleys can flow only northward through the valleys into Las Vegas Valley.

3.0 Groundwater Conditions near the Project Site

3.1 Geologic Setting

The water supply for the project is proposed to be derived from a well constructed within the unconsolidated deposits that underlie the site. A proposed location, and an alternative location are shown on Figure 3. Also shown on Figure 3 are wells near the project site for which information was obtained from the Nevada State Engineer. For each of the wells, a lithologic log (driller's log) and the groundwater depth were obtained, where the groundwater depth represents conditions when the well was constructed. For a few wells, aquifer-test information was obtained. The information for each well is summarized in Table 1.

The well numbers shown on Figure 3 can be used to cross reference between Figure 3 and Table 1. As indicated on Figure 4 and in Table 1, the wells range in depth from 120 to 935 ft. Even though the land surface rises eastward, the well depths have no geographic pattern. As indicated on Figure 5 and in Table 1, the depth to the groundwater table ranges from 80 to 347 ft. Corresponding to the land-surface rise, the groundwater depth increases eastward from less than 200 ft to more than 300 ft. While none of the wells shown on Figure 3 are near the proposed project well, the likely groundwater depth at the project well is about 200 ft.

Figure 6 shows the characteristic textures of the sediments penetrated by the respective wells in terms of three classifications: "F" for fine grained, "M" for medium gained, and "C" for coarse grained. The fine-grained texture is characterized by significant clay, sandy clay, and clayey sand horizons. The medium-grained texture is characterized by significant clayey sand and clayey gravel. Finally, the coarse-grained texture is characterized by significant sand and gravel horizons embedded within fine-grained and medium-grained horizons. The characterizations shown on Figure 6 and listed in Table 1 were derived from lithologic logs submitted to the Nevada State Engineer by drillers. Because drillers have their individual idiosyncrasies regarding lithologic reporting, the available logs are only an approximation of actual subsurface conditions. Nevertheless, considering the overall collection of logs, the subsurface in the vicinity of the proposed production well most likely is composed of sediments of at least medium texture.

That texture would correspond to a hydraulic conductivity of about 2 ft/d, which is toward the low range of conductivities for unconsolidated deposits. That conductivity is derived from the reported specific capacities for wells 3 and 6 in Table 1, which have respective specific capacities of 3.8 and 0.8 gal/min per foot of drawdown. Those specific capacities translate into respective transmissivities of 1,100 and 240 ft^2/d. Those transmissivities correspond to hydraulic conductivities of 2.8 and 1.2 ft/d, based on respective screened intervals of 400 and 200 ft. The average hydraulic conductivity is 2 ft/d. That conductivity is similar to that reported from aquifer tests in the water-supply wells at the Primm Valley Golf Course (Timothy J. Durbin, Inc., 2007). As shown on Figure 2, those wells are located about 8 mi southwest of the proposed project well.

The average hydraulic conductivity of 2 ft/d represents the horizontal conductivity of the unconsolidated deposits. However, the vertical conductivity, specific storage, and specific yield of the deposits also are important hydraulic characteristics. The horizontal hydraulic conductivity represents the ability of the unconsolidated deposits to transmit groundwater horizontally. The vertical conductivity represents the ability to transmit groundwater vertically. The specific storage represents the ability of the deposits to release stored groundwater due to the elastic compaction of the deposits. Finally, the specific yield represents the ability of the deposits to release stored groundwater due to the decline of the groundwater. These hydraulic characteristics for the project site were estimated based on the texture of the unconsolidated deposits as represented by the lithologic logs. Correspondingly, the vertical hydraulic conductivity most likely is about one-tenth of the horizontal conductivity, or 0.2 ft/d. The specific storage is about 10^{-5} 1/ft. The specific yield is about 0.05.

A dry hole was encountered near the proposed site for the project well. However, that occurrence does not indicate aquifer conditions. A records search of the Nevada State Engineer's website revealed only one dry hole within the vicinity of the proposed pumping well. However, the boring, which is located approximately 1.5 miles west of the proposed well location, was only drilled to 73 feet below ground surface. Since the depth to groundwater in the project area from other wells ranges from 80 to 347 feet, it is assumed that the boring for the dry hole was not drilled deep enough.

4.0 Expected Groundwater Drawdowns Due to Project Pumping

The groundwater-level drawdown due the First Solar pumping was evaluated at five locations: within the project well, at the Primm Valley Resort wells, at the Primm Golf Course wells, at the Nevada Energy Goodsprings wells, and at the Nevada Energy Higgins wells. The Primm Valley resort wells are located about 5 mi west of the project well (Figure 2), the Primm Golf Course wells are located 7 mi southwest of the project well (Figure 2), and the Nevada Energy Goodsprings wells are located about 13 mi northwest of the project well (Figure 1). Two alternative well locations for the project well were evaluated with respect to the Nevada Energy Higgins wells, which are identified as Locations 1 and 2 on Figure 2. Location 1 is about 0.5 mi from Higgins wells WP-1A and WP-2 (Figure 2). Location 2 is about 1 mi from Higgins wells WP-1A and WP-2, approximately 0.5 mi north of Location 1. The distances stated above for the Primm Valley Resort, Primm Golf Course, and Nevada Energy Goodsprings wells are each referenced to Location 1.

The site for Location 2 was chosen based on a radial distance of approximately 1 mile from Higgins wells WP-1A and WP-2 in order to model the impacts of the project pumping on those wells from that distance. However, it is possible that the alternate well location will ultimately be located directly to the east of Location 1. Using an alternate well location to the east of Location 1 would result in simulation of the same impacts on wells WP-1A and WP-2 as the location to the north, assuming the same radial distance of 1 mile.

The drawdown in the proposed project well depends on the hydraulic characteristics of the unconsolidated deposits. Based on the parameter values described above, the U. S. Geological Survey computer program WTAQ (Barlow and Moench, 1999) was used to predict the groundwater-level drawdowns in the proposed project well and the surrounding area. WTAQ simulates drawdown due to pumping from a well in a radially-symmetric three-dimensional groundwater system, where the well screen penetrates only part of the aquifer thickness. Based on the assumption of an aquifer thickness of 1,000 ft at the proposed project well, WTAQ was used to simulate pumping from a well with an 8-inch casing diameter. Two alternative well designs were simulated.

For the first design, the well extends 400 ft below the groundwater table, which represents a 600-foot well, based on a groundwater depth of 200 ft. A 100-foot well screen extends from 300 to 400 ft below the groundwater table, or 500 to 600 feet below ground surface (bgs). With a groundwater table at 200 feet bgs, this allows for up to 300 feet of drawdown before the water level encroaches on the well screen. For the second design, the well extends 600 ft below the groundwater table, which represents an 800-foot well, based again on a groundwater depth of 200 ft. A 300-foot well screen extends from 300 to 600 ft below the groundwater table, or 500 to 800 feet bgs.

These two well designs represent the estimated range in the well depths and screen lengths that will be necessary to meet the demands of this project. The actual well design could have a depth anywhere between 600 to 800 feet bgs, with screened intervals anywhere between 100 to 300 feet in length. The simulation results are shown on Figures 7 through 16, and also in Table 2.

4.1 Long Term Pumping

4.1.1 General Impacts

Figures 7 and 8 show the long-term drawdowns for the two well designs, respectively. The pumping rate from the well is 200 acre-ft/yr during a four-year construction period and then 20 acre-ft/yr thereafter. That pumping schedule is represented in the simulation as continuous pumping at 125 gal/min or 24,000 ft^3/d and then 12.5 gal/min or 2,400 ft^3/d. Five drawdown hydrographs are shown on each figure, which respectively represent the pumped well, and distances of 0.5, 1, 2, and 3 mi from the pumped well.

After the 4 years of construction pumping, the drawdown in the 600-foot well (first design) is about 106 ft and the drawdown at a distance of 3 mi from the well is about 0.01 ft (Figure 7). After the 4 years of construction pumping for the 800-foot well (second design), the drawdown in the pumping well is about 43 ft and the drawdown at a distance of 3 mi from the well is about 0.01 ft (Figure 8).

After 50 years of construction and then operational pumping, the drawdown in the project well for the 600-foot and 800-foot designs is about 11 ft and 4.6 feet, respectively. The drawdown caused by both well designs at a distance of 3 mi from the well is still less than a foot.

4.1.2 Impacts at Primm Valley Resort and Primm Valley Golf Course Wells

The Primm Valley Resort and Primm Valley Golf Course wells are located approximately five miles, and seven miles, respectively, from the proposed project well Location 1 (Figure 2). For both well designs, the short-term construction pumping from the project well produces zero drawdown effects at those distances (Table 2). The long-term operational pumping will produce less than a tenth of a foot of drawdown at those production wells after the 50-year life of the project (Table 2). Due to the negligible drawdown results from the simulations, only Location 1 was evaluated with respect to the Primm Valley Resort and Primm Valley Golf Course wells.

4.1.3 Impacts at Nevada Energy Higgins Wells

The Walter M. Higgins Generating Station, operated by Nevada Energy (NVE), utilizes groundwater wells in the vicinity of the proposed pumping well, as seen on Figure 3. Wells WP-1A and WP-2 are backup wells that are used very rarely. WP-3 is not currently used, and WP-4 uses only a negligible amount of water.

The impact of the First Solar pumping on the NVE wells was evaluated assuming two alternative locations for the First Solar well. The distance between the alternative pumping Location 1 and the NVE wells ranges from 0.5 to 1 mile (Figure 2). The distance between the alternate pumping Location 2 and the NVE wells ranges from 1 to 1.4 miles (Figure 2). Figures 9 and 10 show the simulated drawdown due to short-term construction pumping and long-term operational pumping that can be expected at each of the NVE wells from the alternative pumping locations for the first and second well designs. The results are also summarized in Table 2.

For both well designs pumping from Location 1, less than 2 feet of drawdown will occur at wells WP-1A and WP-2 after four years of construction pumping at the average rate of 125 gal/min (Table 2). The long-term operational pumping from Location 1 will produce less than half a foot of drawdown at the NVE production wells after the 50-year life of the project (Table 2).

A well installed at Location 2 will produce less than 1 foot of drawdown at wells WP-1A and WP-2 after four years of construction pumping (Table 2). The long-term operational pumping from Location 2 will produce less than half a foot of drawdown at the NVE production wells after the 50-year life of the project (Table 2).

4.1.3 Impacts at Nevada Energy Goodsprings Wells

NV Energy operates the Goodsprings Waste Heat Recovery Station located approximately 13 miles northwest of the proposed pumping well (Figure 1). Neither construction nor operational pumping for the life of the project will affect the drawdown at wells on the Goodsprings site (Table 2). At a distance of 10 miles from the proposed pumping well, a drawdown of less than 0.01 ft is observed after 50 years of construction and then operational pumping.

4.2 Peak Pumping

Peak groundwater demands were simulated based on the assumptions that peak facility water demands for groundwater will be offset by storage in a man-made pond. Peak groundwater demands were evaluated assuming storage pond capacities of 1 million gallons, 2 million gallons, and 3 million gallons.

4.2.1 General Impacts

Figures 11 to 13 show the short-term drawdowns for the peak pumping in the 600-foot well design (first design). The pumping rates from the well vary, depending on pond size. 315, 240, and 175 gal/min pumping rates correspond with pond sizes of 1, 2, and 3 million gallons, respectively. The pumping rates, in conjunction with pond withdrawals, satisfy a continuous 10-day daily construction demand of 550,000 gal/day. After ten days at peak pumping for the 600-foot well, drawdown in the pumping well was about 140, 190, and 250 feet for pumping rates of 175, 240, and 315 gal/min, respectively (Table 2). Drawdown at a distance of 200 ft from the pumping well was about 15, 20, and 25 ft for pumping rates of 175, 240, and 315 gal/min, respectively.

Figures 14 to 16 show the short-term drawdowns for the peak pumping in the 800-foot well design (second design). The pumping rates vary depending on pond size, as mentioned above. After ten days at peak pumping for the 800-foot well, drawdown in the pumping well was about 53, 73, and 96 feet for pumping rates of 175, 240, and 315 gal/min, respectively (Table 2). Drawdown at a distance of 200 ft from the pumping well was about 8, 10, and 14 ft for pumping rates of 175, 240, and 315 gal/min, respectively.

4.2.1 Impacts at Nevada Energy Higgins Wells

The 10-day peak pumping demands do not display any additional drawdown effects on the local production wells. The closest production well to the project well is NVE well WP-1A, approximately 0.5 mi from project well Location 1. The simulation results show zero drawdown at 0.5 mi from the project well, and show less than 0.1-feet of drawdown at a distance of 1600 feet from the project well after the 10-day peak pumping event. Peak pumping rates occurring during the long-term construction and operational pumping will not lead to increased drawdown at the local production wells, as long as the peak pumping rates and durations do not exceed the values simulated by the model. Drawdown amounts caused by the long-term pumping, as discussed above, should still be expected.

4.3 Cumulative Effects on Nevada Energy Higgins Wells

Nevada Energy wells WP-1A and WP-2 may be used to supply water to the Walter M. Higgins Generating Station on an emergency basis. WTAQ was used to simulate drawdown in wells WP-1A and WP-2, and any drawdown in the First Solar project well that resulted from an emergency use. Well construction data used in the simulation was obtained from the Nevada State Engineer's website. WP-1A is screened from 155 to 275 feet below the water table. WP-2 is screened from the water table to 400 feet below the

water table. Actual pumping values were not obtained for NVE wells WP-1A and WP-2, however, an average value of 156 gal/min was calculated using a total demand of 252 acre-feet per year for the generating station. A worst-case scenario for peak pumping was assumed to be 312 gal/min, or double the average demand. For simulation purposes, it was assumed that the emergency wells would be pumping for a maximum of 10 consecutive days.

Figure 17 shows the simulated drawdown in wells WP-1A and WP-2 during average and peak use for 10 days. The maximum drawdown encountered in well WP-1A is about 108 feet for average use, and 215 feet for peak use. The maximum drawdown in WP-2 is about 36 feet for average use, and 73 feet for peak use. At a distance of 0.5 mi from the NVE wells, the proposed project well at Location 1 displays zero drawdown caused by wells WP-1A and WP-2 after ten consecutive days of pumping at both average and peak pumping rates.

The maximum drawdown caused by the First Solar project well on NVE wells WP-1A and WP-2 will be approximately 2 feet (Table 2). This maximum value will only occur at the end of the 4-year construction period, and is only applicable for a well constructed at Location 1 (Figure 2). After construction, the drawdown will gradually decrease to about 0.5 feet as only operational pumping occurs (Figures 9 and 10).

The principle of superposition allows for the calculation of drawdown at a given distance from more than one well equal to the sum of the individual drawdown values caused by each well at the location. Adding the 2 feet of drawdown caused by the project well to the drawdown results from emergency pumping shows that total drawdown encountered in WP-1A can be as much as 110 feet for the average pumping rate of 156 gal/min, and 217 feet for the peak pumping rate of 312 gal/min. For WP-2, total drawdown can be as much as 38 feet for the average pumping rate of 156 gal/min, and 75 feet for the peak pumping rate of 312 gal/min. Cumulative drawdown values are presented in Table 3.

5.0 Groundwater Quality

Groundwater-quality data for the project site were not available for this evaluation. However, water-quality data were available for the vicinity of the Primm Valley Golf Course, which is located on the west side of Ivanpah Valley about 8 mi southwest of the project well. The general water-quality condition is that poor-quality groundwater occurs near the valley center, but groundwater-quality improves westward from the valley center. Near the valley center, dissolved solids are 1,000 mg/L and higher. Near the golf-course wells and westward, the dissolved solids are about 600 mg/L and lower. However, at both locations, dissolved solids tend to increase with depth. The groundwater-quality conditions near the project site may be similar. Dissolved solids are highest near the valley center, but they decrease eastward. Furthermore, dissolved solids may increase with depth.

6.0 Discussion

Based on the simulation of long-term demands as shown on Figures 7 and 8, the proposed project well will not have significant impacts on the water supply well for the Primm resort area or the Primm Valley Golf Course wells (Figure 2). The groundwater drawdown at either the resort or golf-course wells will be extremely small. Likewise, the pumping from those wells will have extremely small impacts on the proposed project well.

Tables 2 and 3 summarize the effects that construction and operational pumping will have on the NVE Higgins wells. For a well constructed at Location 1, the maximum amount of additional drawdown caused by the project well at the Higgins wells is about 2 feet at the end of the 4-year construction period, and only about 0.5 feet after the 50-year life of the project. For a well constructed at Location 2, the maximum amount of additional drawdown caused by the project well at the Higgins wells is about 0.8 feet at the end of the 4-year construction period, and only about 0.3 feet after the 50-year life of the project. These additional drawdown amounts should have little effect on the ability of WP-1A or WP-2 to perform their duties at backup wells.

Peak pumping during construction needed to supply 550,000 gal/day for ten consecutive days will have no increased effect on the drawdown in the NVE wells. Also, wells located on the Goodsprings site will not be affected by either the peak pumping, or long tem pumping for the project.

Based on the simulation of short-term peak pumping as shown on Figures 11 to 16, some difficulty could be encountered in meeting peak demands. For the 600-foot well design, the simulated drawdown values in the pumped well are 140, 190, and 250 ft when pumping at 175, 240, and 315 gal/min, respectively. Those drawdown values will affect the efficiency of the pump, due to the increased lift needed to get the water to the surface. Also, peak pumping at 315 gal/min approaches the screened interval for the well. If drawdown below the screened interval were to occur, the well would most likely encounter functional difficulties.

For the second well design, which is for an 800-foot well, the simulated drawdown values in the pumped well are 53, 73, and 96 ft after ten days for pumping values of 175, 240, and 315 gal/min, respectively. This design does not have excessive drawdowns within the pumped well, but the greater well depth might result in higher dissolved solids within the pumped water.

As mentioned earlier in the report, the two well designs that were simulated represent the probable ranges of well depth and screen length. The final well design will ultimately be determined by analyzing the lithologic and geophysical logs of a test hole. An 800-foot test hole is recommended, as it would span the depths of both well designs, and enable the appropriate analysis needed to ensure the constructed well meets the demands of the project and minimizes impacts to the resource.

7.0 References Cited

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Table 1 -- Well with Lithologic Logs within Study Area

Well ID	Nevada Log Number	Township Range Section	Quarter	Owner	Construction Date	Well Depth (feet)
1	690	S27/E59-8	NE NE	PRIMM, E J	09/27/48	600
2	2861	S27/E59-16	NE NE	PRIMM INVESTMENT CO	01/05/55	555
3	19773	S27/E59-9	NW NE	WHISKEY PETES HOTEL & CASINO	10/27/78	605
4	19774	S27/E59-9	SE NE	WHISKEY PETES HOTEL & CASINO	02/02/79	395
5	28658	S27/E59-10	SW NE	WHISKEY PETES HOTEL & CASINO	05/06/87	560
6	28659	S27/E59-10	SW NE	WHISKEY PETES HOTEL & CASINO	04/28/87	600
7	36704	S27/E59-8	SE SE	WHISKEY PETES HOTEL & CASINO	03/04/92	235
8	36705	S27/E59-8	SE SE	WHISKEY PETES HOTEL & CASINO	03/04/92	250
9	36706	S27/E59-9	SW NE	WHISKEY PETES HOTEL & CASINO	03/04/92	250
10	36707	S27/E59-9	SW NE	WHISKEY PETES HOTEL & CASINO	03/04/92	160
11	64308	S27/E59-5	NE NE	PRIMM INVESTMENT CO	06/11/54	672
12	64311	S27/E59-8	NE NW	BARHAM, EARLE M	09/25/55	150
13	64312	S27/E59-8	NW NE	DABAU, RAY & SWIFT, GEORGE	03/02/54	617
14	64313	S27/E59-8	NW NE	TOWER CLUB CASINO	07/03/82	300
15	72448	S27/E59-8	SE NW	PRIMADONNA RESORTS	08/10/98	935
16	75640	S27/E59-8	SE NW	PRIMADONNA RESORTS	08/10/98	935
17	77553	S27/E59-8	SW NE	PRIMADONNA RESORTS	12/09/99	240
18	77554	S27/E59-8	SW NE	PRIMADONNA RESORTS	12/09/99	240
19	77555	S27/E59-8	SW NE	PRIMADONNA RESORTS	12/09/99	120
20	77556	S27/E59-8	SW SE	PRIMADONNA RESORTS	12/09/99	120
21	86866	S27/E59-9	NW SE	GRAYCOR	07/31/02	238
22	86867	S27/E59-9	NW SE	GRAYCOR	07/31/02	238
23	86913	S27/E59-9	NW SE	GRAYCOR	08/08/02	232

Table 1 -- Well with Lithologic Logs within Study Area (continued).

Well ID	Township Range Section	Quarter	Water Depth (feet)	Land Elevation (feet)	Water Elevation (feet)	Lithologic Type	Test Pumping Rate (gal/min)	Specific Capacity (gal/min/ft)
1	S27/E59-8	NE NE	85	2625	2540	M	100	
2	S27/E59-16	NE NE	105	2798	2693	M		
3	S27/E59-9	NW NE	190	2679	2489	M	318	3.80
4	S27/E59-9	SE NE	120	2714	2594	F		
5	S27/E59-10	SW NE	312	2913	2601	C		
6	S27/E59-10	SW NE	347	2913	2566	C	90	0.80
7	S27/E59-8	SE SE	200	2607	2407	C	15	
8	S27/E59-8	SE SE	195	2607	2412	M	15	
9	S27/E59-9	SW NE	200	2769	2569	C	15	
10	S27/E59-9	SW NE	135	2769	2634	C	15	
11	S27/E59-5	NE NE	100	2610	2510	M		
12	S27/E59-8	NE NW	115	2617	2502	F		
13	S27/E59-8	NW NE	159	2672	2513	F		
14	S27/E59-8	NW NE	121	2672	2551	M		
15	S27/E59-8	SE NW	110	2610	2500	M	145	
16	S27/E59-8	SE NW	110	2610	2500	M	145	
17	S27/E59-8	SW NE	155	2646	2491	C		
18	S27/E59-8	SW NE	166	2646	2480	C		
19	S27/E59-8	SW NE	80	2646	2566	C		
20	S27/E59-8	SW SE	101	2653	2552	C		
21	S27/E59-9	NW SE	160	2693	2533	F		
22	S27/E59-9	NW SE	160	2693	2533	F		
23	S27/E59-9	NW SE	187	2693	2506	M		

Table 2 -- Drawdowns Due to First Solar Pumping

Pumping Rate (gal/min)		Project Well Location[1]	Pumping Duration	Drawdown Location	Drawdown[2] (ft)	
Construc-tion	Operation				600-ft Pumping Well	800-ft Pumping Well
125	0	1 or 2	4 yrs	Project well	106	43
0	12.5		46 yrs	Project well	11	5
125	0	1	4 yrs	Primm Valley Resorts wells	0	0
				Primm Golf Course wells	0	0
				Goodsprings wells	0	0
0	12.5	1	46 yrs	Primm Valley Resorts wells	0.06	0.06
				Primm Golf Course wells	0.02	0.02
				Goodsprings wells	0	0
125	0	1	4 yrs	Nevada Energy well WP-1A	1.87	1.85
				Nevada Energy well WP-2	1.54	1.53
0	12.5	1	46 yrs	Nevada Energy well WP-1A	0.49	0.49
				Nevada Energy well WP-2	0.46	0.45
125	0	2	4 yrs	Nevada Energy well WP-1A	0.74	0.75
				Nevada Energy well WP-2	0.62	0.62
0	12.5	2	46 yrs	Nevada Energy well WP-1A	0.36	0.36
				Nevada Energy well WP-2	0.34	0.34
175	0	1 or 2	10 days	Project well	141	53
240			10 days		193	73
315			10 days		254	96
175	0	1	10 days	Nevada Energy well WP-1A	0	0
240			10 days		0	0
315			10 days		0	0
175	0	2	10 days	Nevada Energy well WP-1A	0	0
240			10 days		0	0
315			10 days		0	0
175	0	1	10 days	Nevada Energy well WP-2	0	0
240			10 days		0	0
315			10 days		0	0
175	0	2	10 days	Nevada Energy well WP-2	0	0
240			10 days		0	0
315			10 days		0	0

[1]See Figure 6 for well location.

[2]Drawdowns listed for the conclusion of the operational life of the facility are simulated based on four years of construction pumping followed by 46 years of operational pumping for a total of 50 years of pumping.

Table 3 -- Estimated Drawdown in Nevada Energy Higgins Wells

NVE Well ID	Well Design	Project Well Location	Project Pumping	Drawdown (ft)	
				10-Day Average Pumping (156 gal/min)	10-Day Peak Pumping (312 gal/min)
1A	1	1	**No Project Pumping**	**107.50**	**214.90**
1A	1	1	4-year Construction	109.37	216.77
1A	1	1	50-year Construction and Operational	107.99	215.39
1A	1	1	10-day Peak	107.50	214.90
1A	1	2	4-year Construction	108.24	215.64
1A	1	2	50-year Construction and Operational	107.86	215.26
1A	1	2	10-day Peak	107.50	214.90
1A	2	1	4-year Construction	109.35	216.75
1A	2	1	50-year Construction and Operational	107.99	215.39
1A	2	1	10-day Peak	107.50	214.90
1A	2	2	4-year Construction	108.25	215.65
1A	2	2	50-year Construction and Operational	107.86	215.26
1A	2	2	10-day Peak	107.50	214.90
2	1	1	**No Project Pumping**	**36.35**	**72.63**
2	1	1	4-year Construction	37.89	74.17
2	1	1	50-year Construction and Operational	36.81	73.09
2	1	1	10-day Peak	36.35	72.63
2	1	2	4-year Construction	36.97	73.25
2	1	2	50-year Construction and Operational	36.69	72.97
2	1	2	10-day Peak	36.35	72.63
2	2	1	4-year Construction	37.88	74.16
2	2	1	50-year Construction and Operational	36.80	73.08
2	2	1	10-day Peak	36.35	72.63
2	2	2	4-year Construction	36.97	73.25
2	2	2	50-year Construction and Operational	36.69	72.97
2	2	2	10-day Peak	36.35	72.63

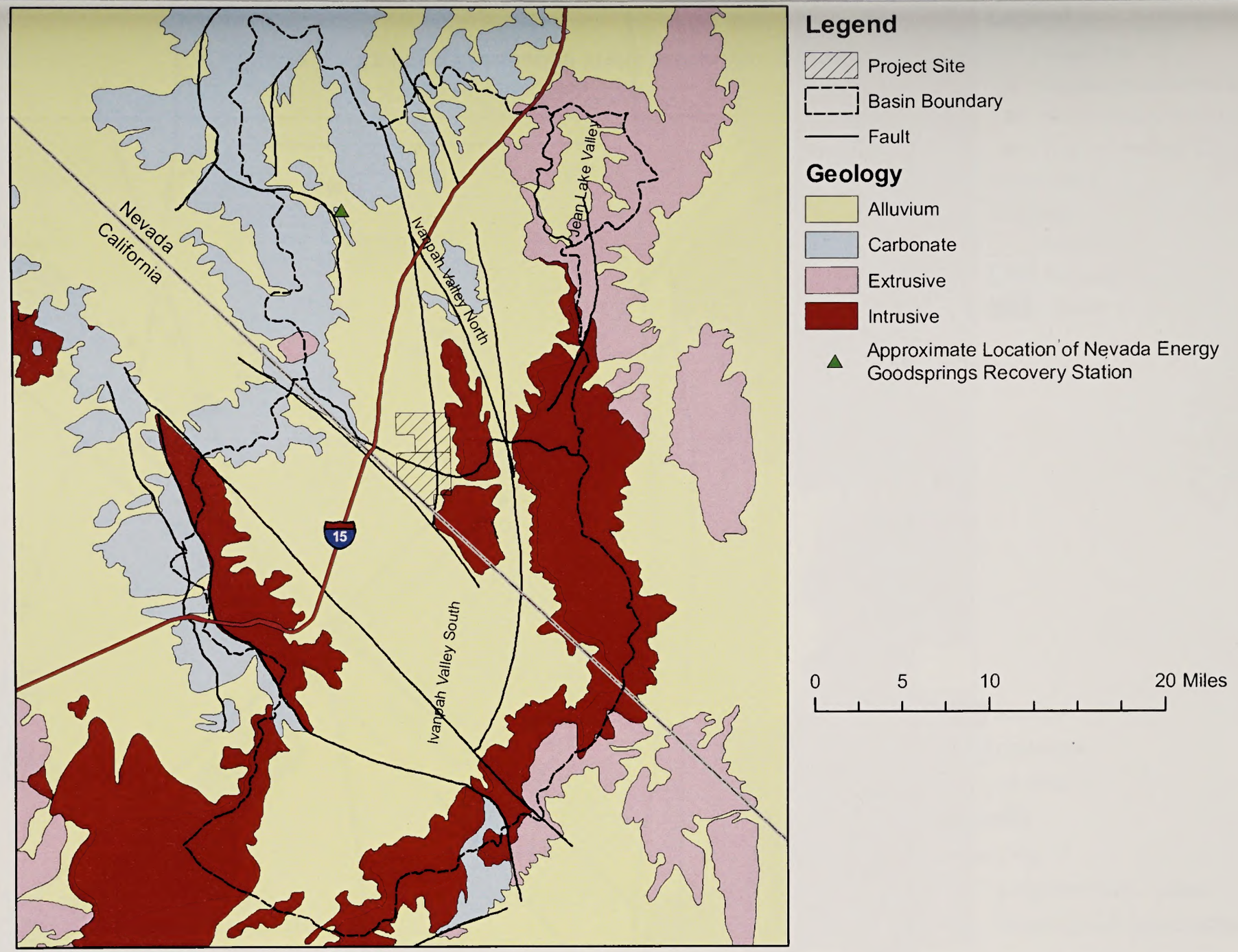


Figure 1 -- Hydrogeology of Study Region.

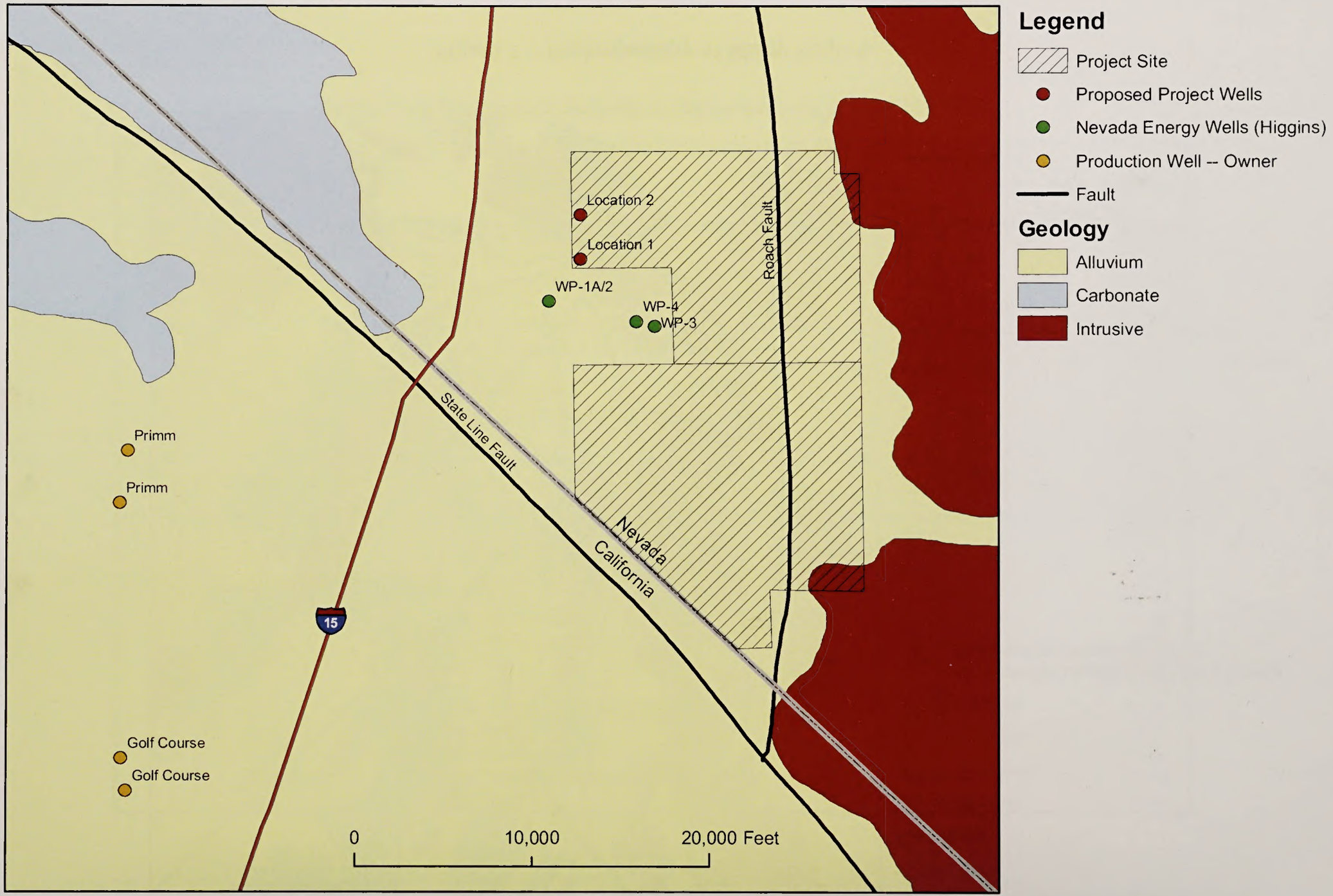


Figure 2 -- Existing Production Wells within Study Area.

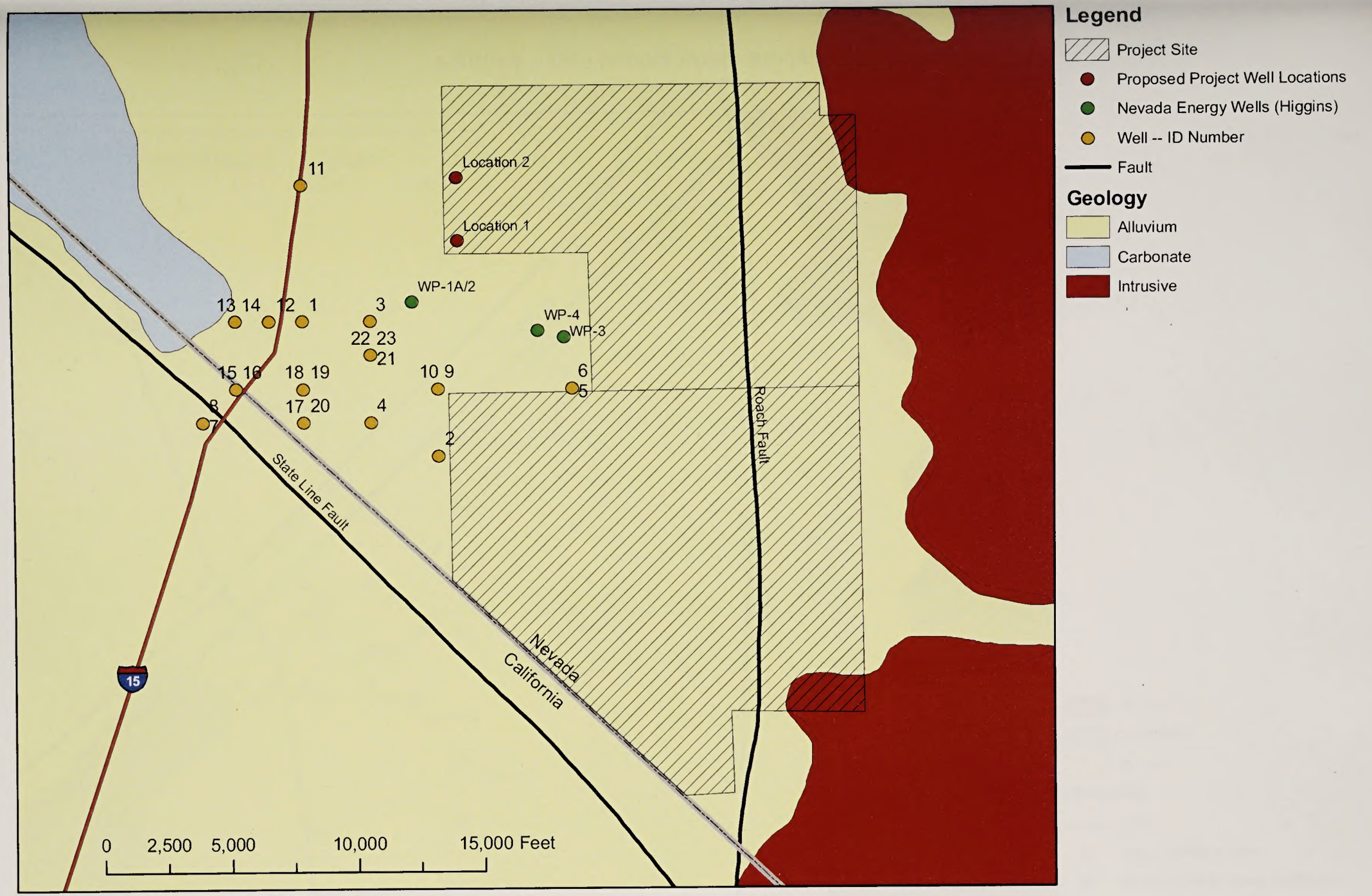


Figure 3 -- Wells with Lithologic Logs within Study Area.

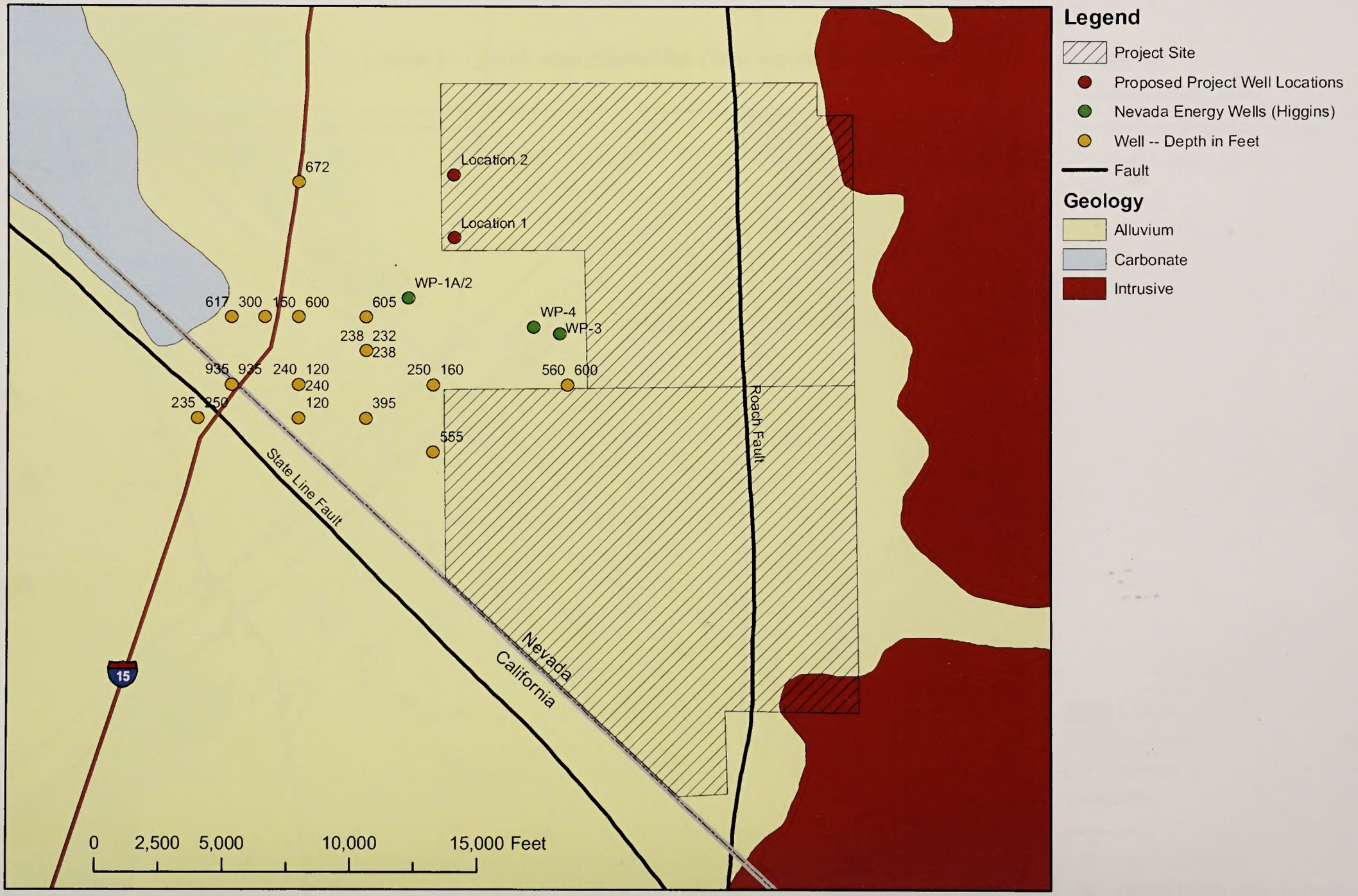


Figure 4 -- Well Depths within Study Area.

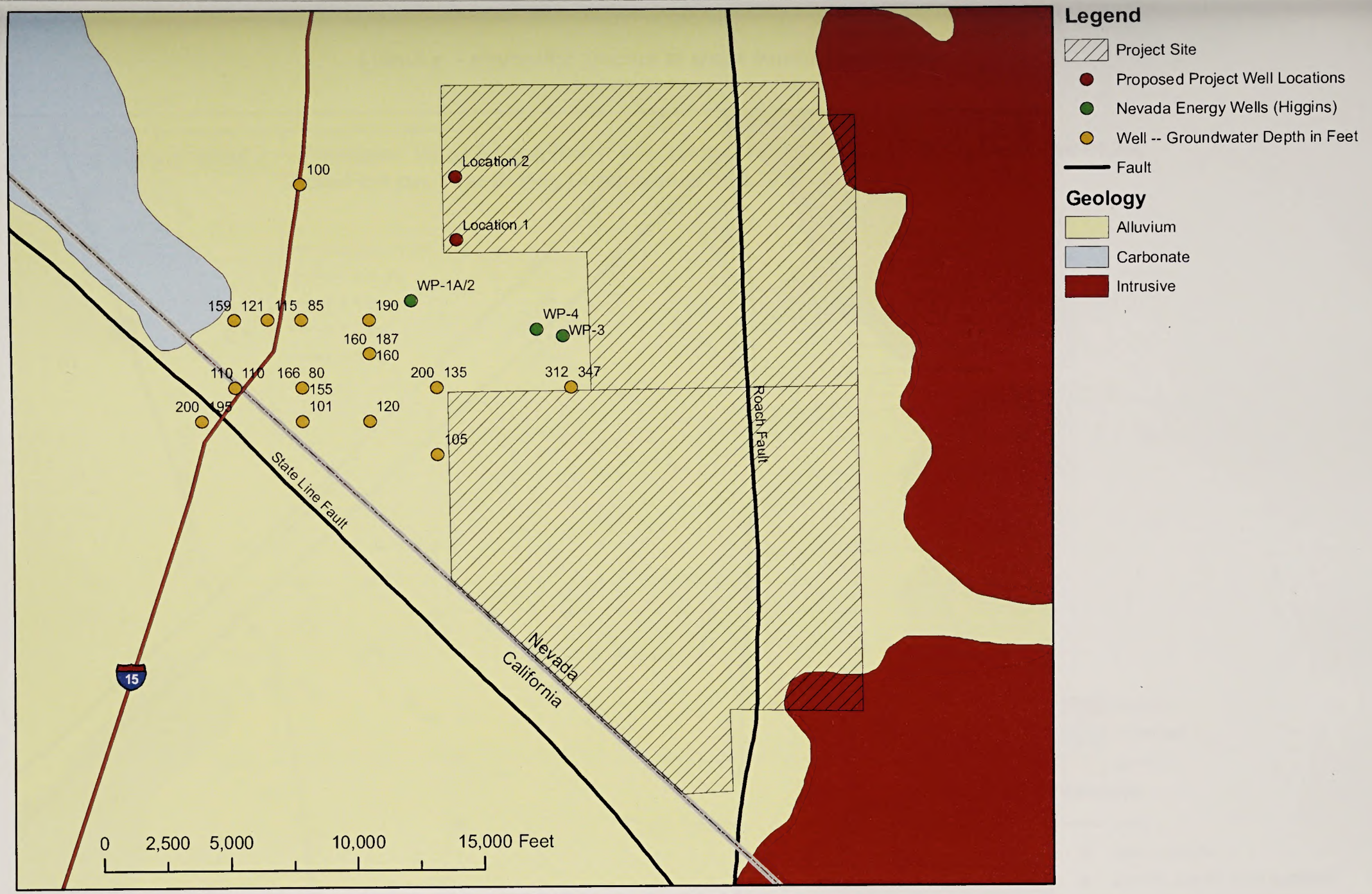


Figure 5 -- Groundwater Depths within Study Area.

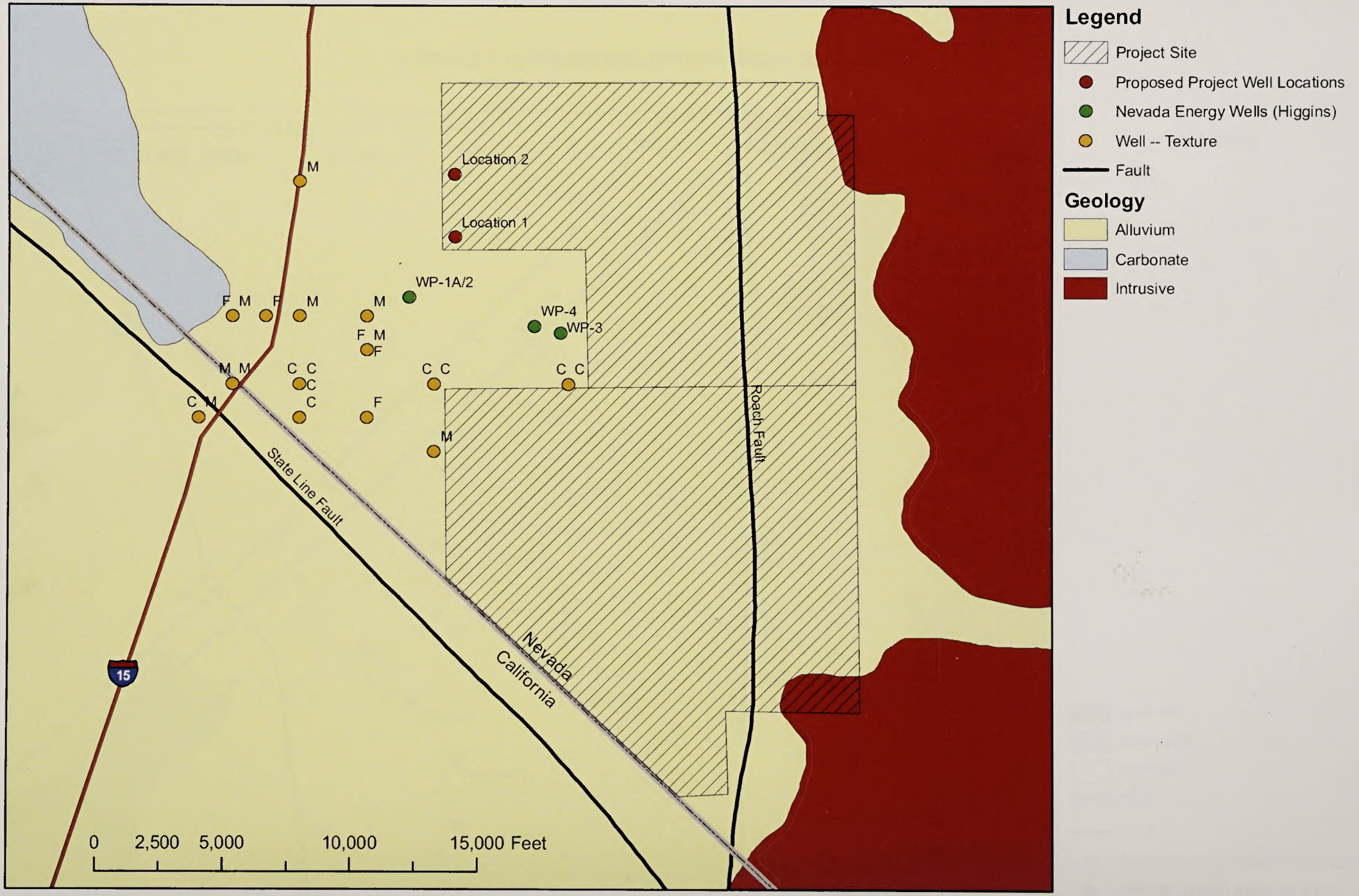


Figure 6 -- Lithologic Texture at Wells within Study Area.

Figure 7 -- Drawdown for 600-Foot Well (First Design) with Long-Term Pumping Rates of 200 Acre-Feet per Year During Construction and 20 Acre-Feet per Year After.

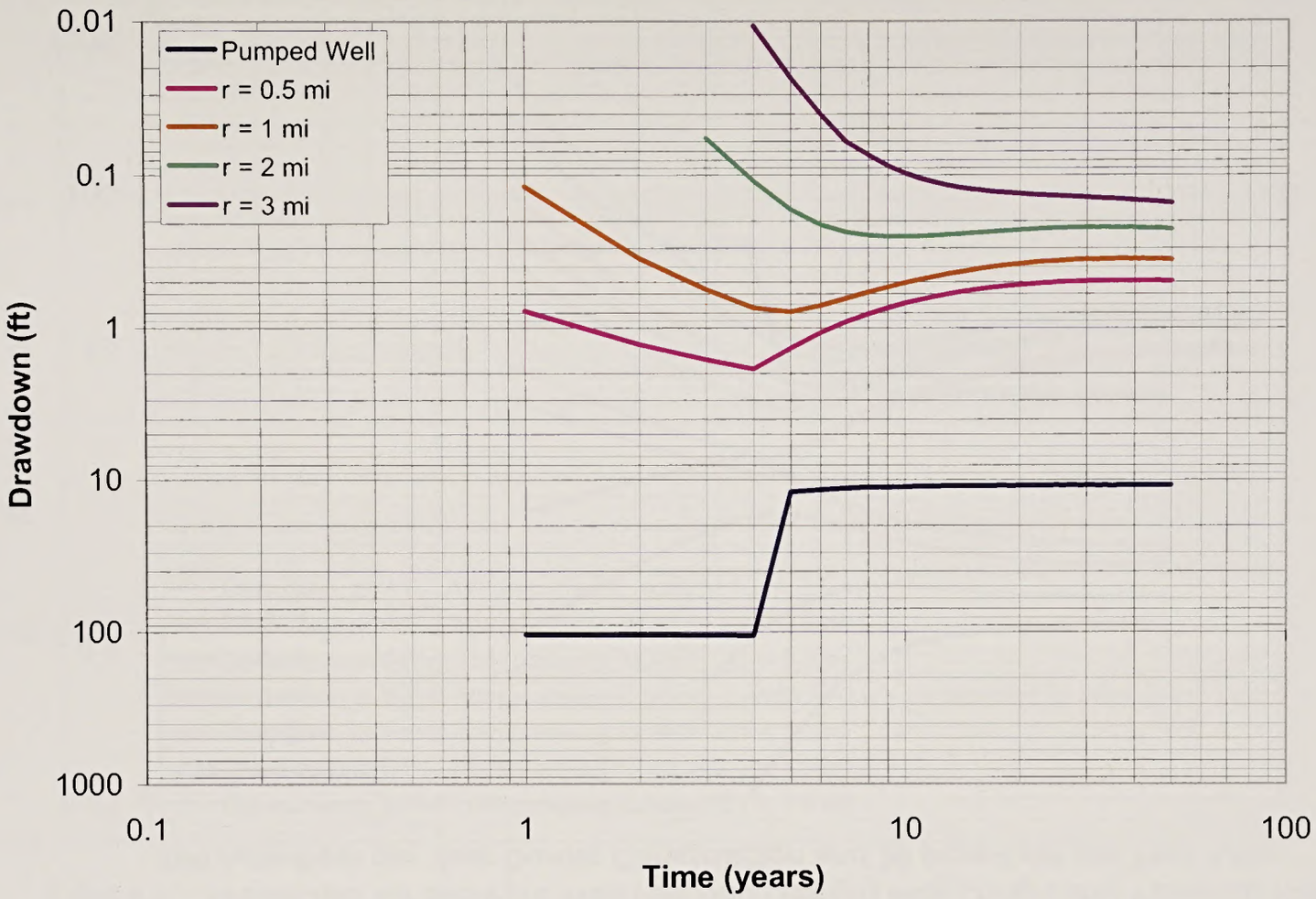


Figure 8 -- Drawdown for 800-Foot Well (Second Design) with Long-Term Pumping Rates of 200 Acre-Feet per Year During Construction and 20 Acre-Feet per Year After.

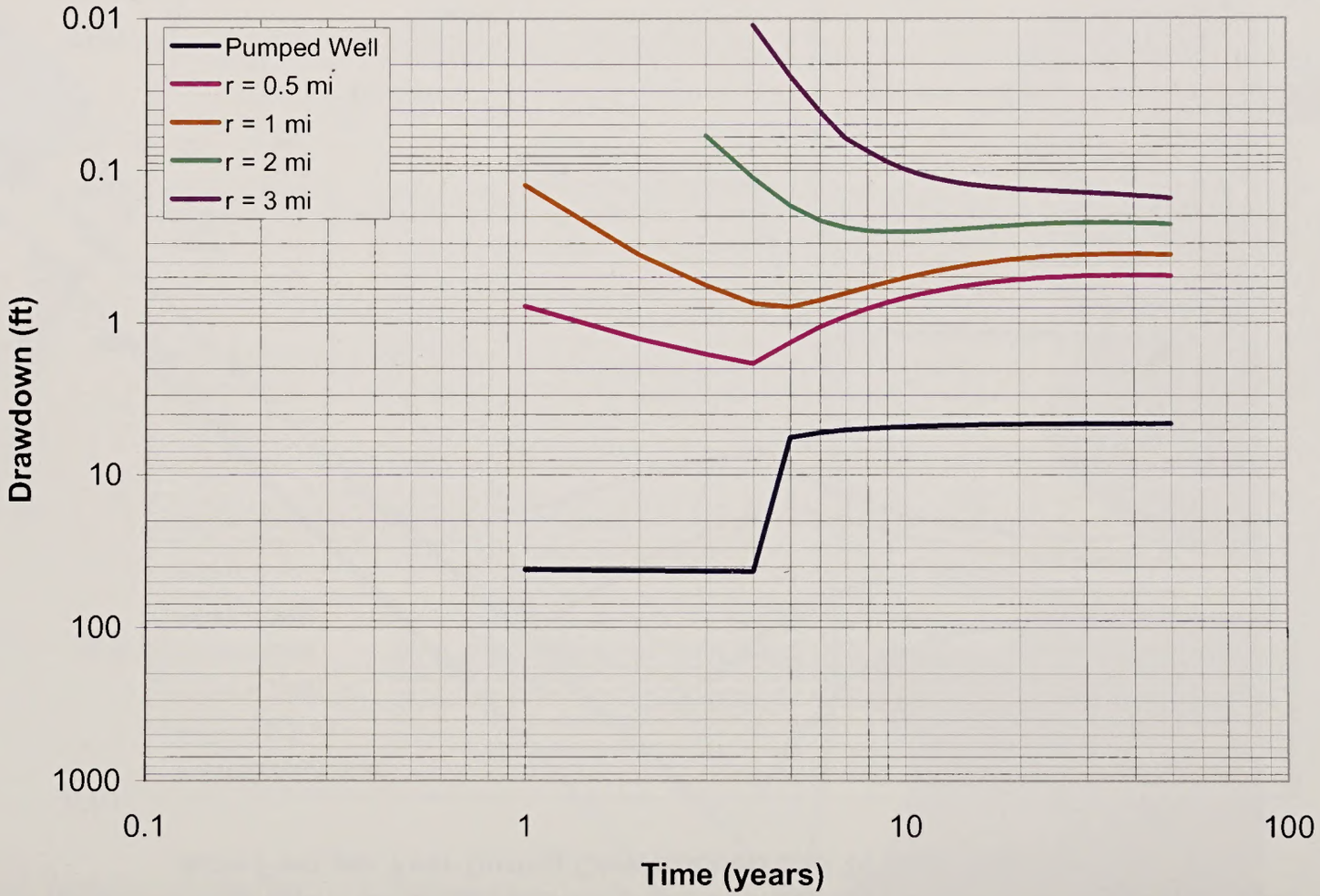


Figure 9 -- Drawdown at Nevada Energy Wells for 600 Foot Well (First Design) with Long-Term Pumping Rates of 200 Acre-Feet per Year During Construction and 20 Acre-Feet per Year After.

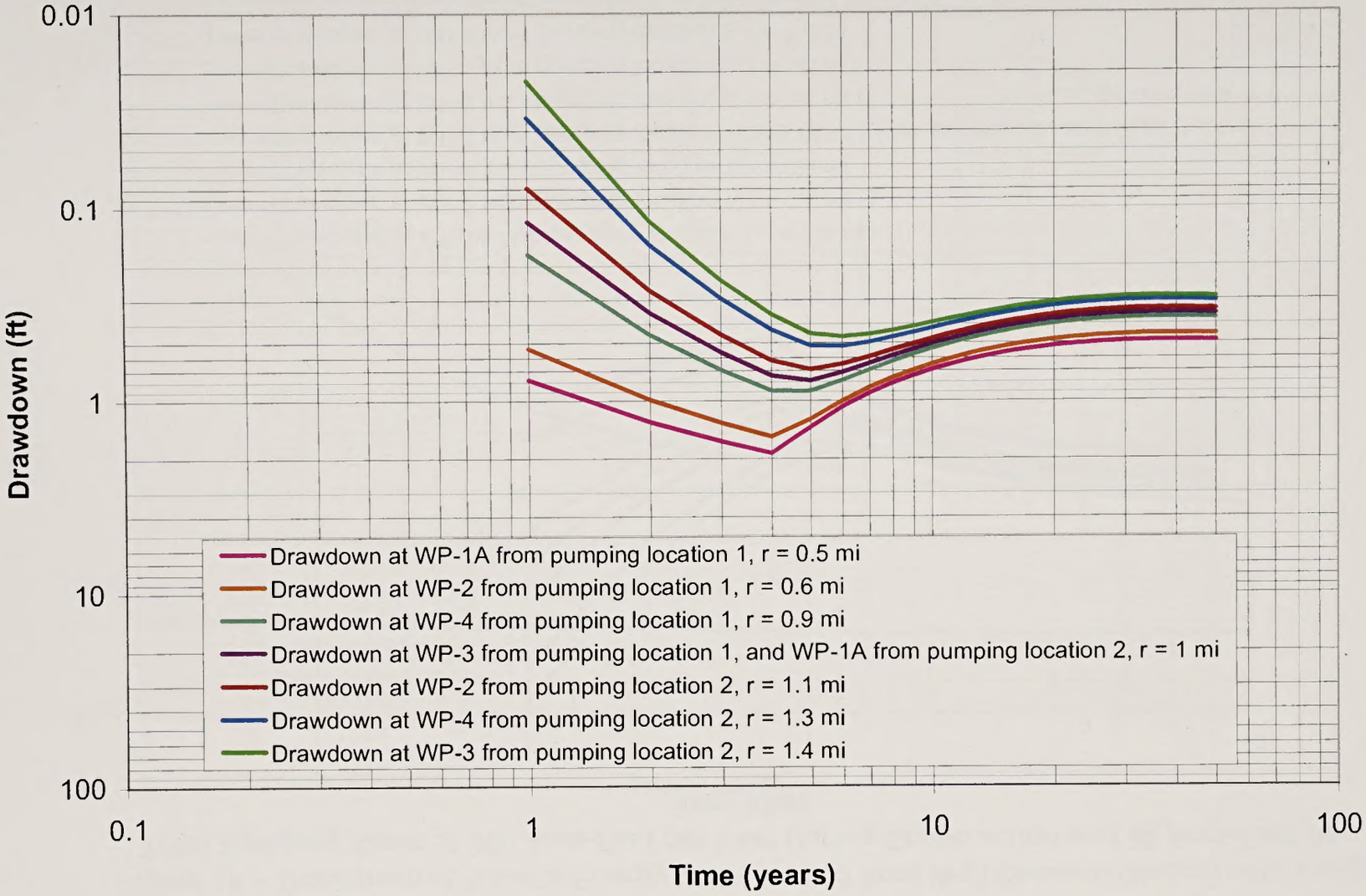

0.01
0.1
1
10
100
Drawdown (ft)
0.1
1
10
100
Time (years)
Drawdown at WP-1A from pumping location 1, r = 0.5 mi
Drawdown at WP-2 from pumping location 1, r = 0.6 mi
Drawdown at WP-4 from pumping location 1, r = 0.9 mi
Drawdown at WP-3 from pumping location 1, and WP-1A from pumping location 2, r = 1 mi
Drawdown at WP-2 from pumping location 2, r = 1.1 mi
Drawdown at WP-4 from pumping location 2, r = 1.3 mi
Drawdown at WP-3 from pumping location 2, r = 1.4 mi

Figure 10 -- Drawdown at Nevada Energy Wells for 800 Foot Well (Second Design) with Long-Term Pumping Rates of 200 Acre-Feet per Year During Construction and 20 Acre-Feet per Year After.

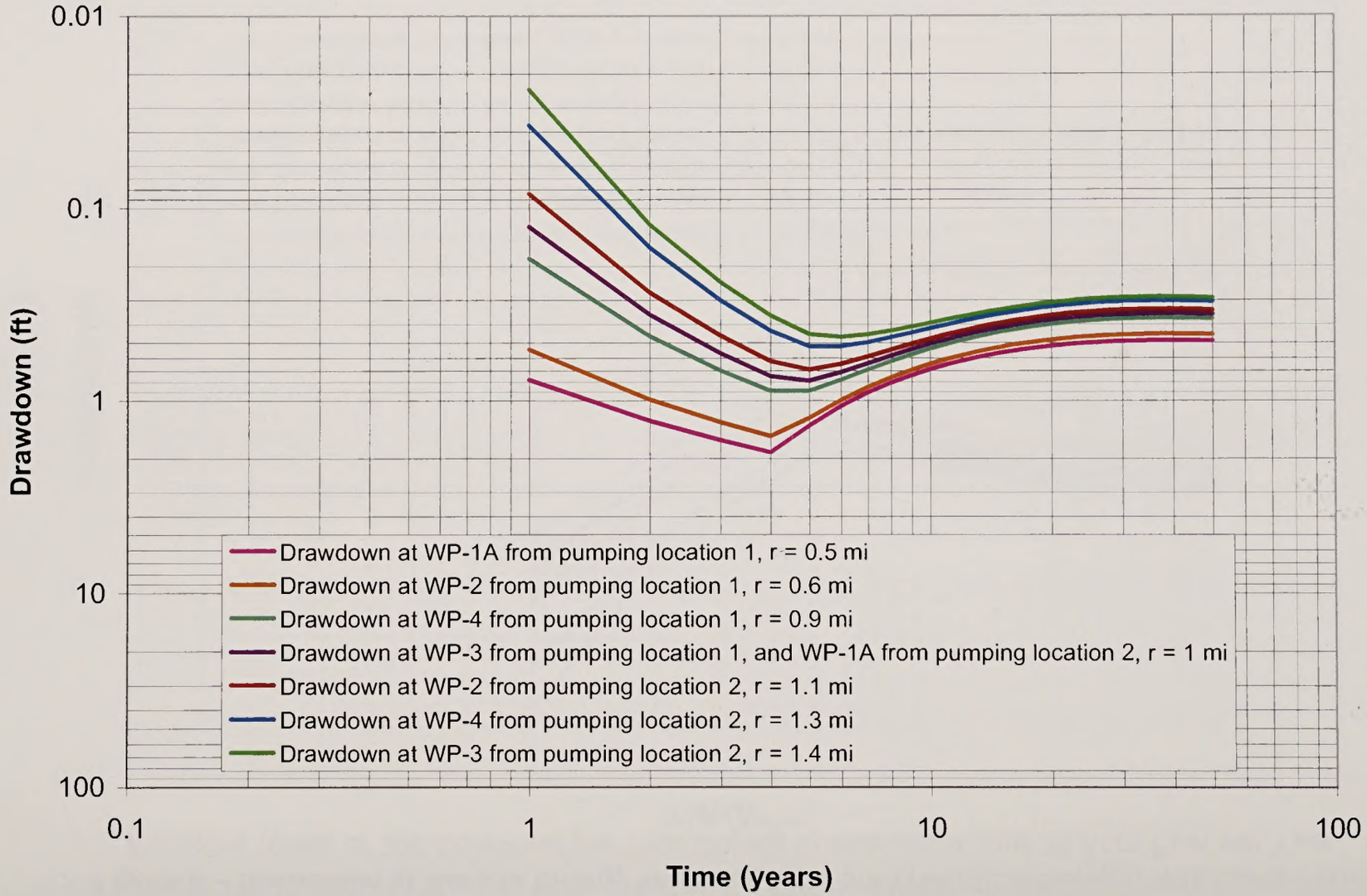

0.01
0.1
1
10
100
Drawdown (ft)
0.1
1
10
100
Time (years)
Drawdown at WP-1A from pumping location 1, r = 0.5 mi
Drawdown at WP-2 from pumping location 1, r = 0.6 mi
Drawdown at WP-4 from pumping location 1, r = 0.9 mi
Drawdown at WP-3 from pumping location 1, and WP-1A from pumping location 2, r = 1 mi
Drawdown at WP-2 from pumping location 2, r = 1.1 mi
Drawdown at WP-4 from pumping location 2, r = 1.3 mi
Drawdown at WP-3 from pumping location 2, r = 1.4 mi

Figure 11 -- Drawdown for 600-Foot Well (First Design) with 315 Gallons per Minute Pumping Rate, 1 Million Gallon Pond.

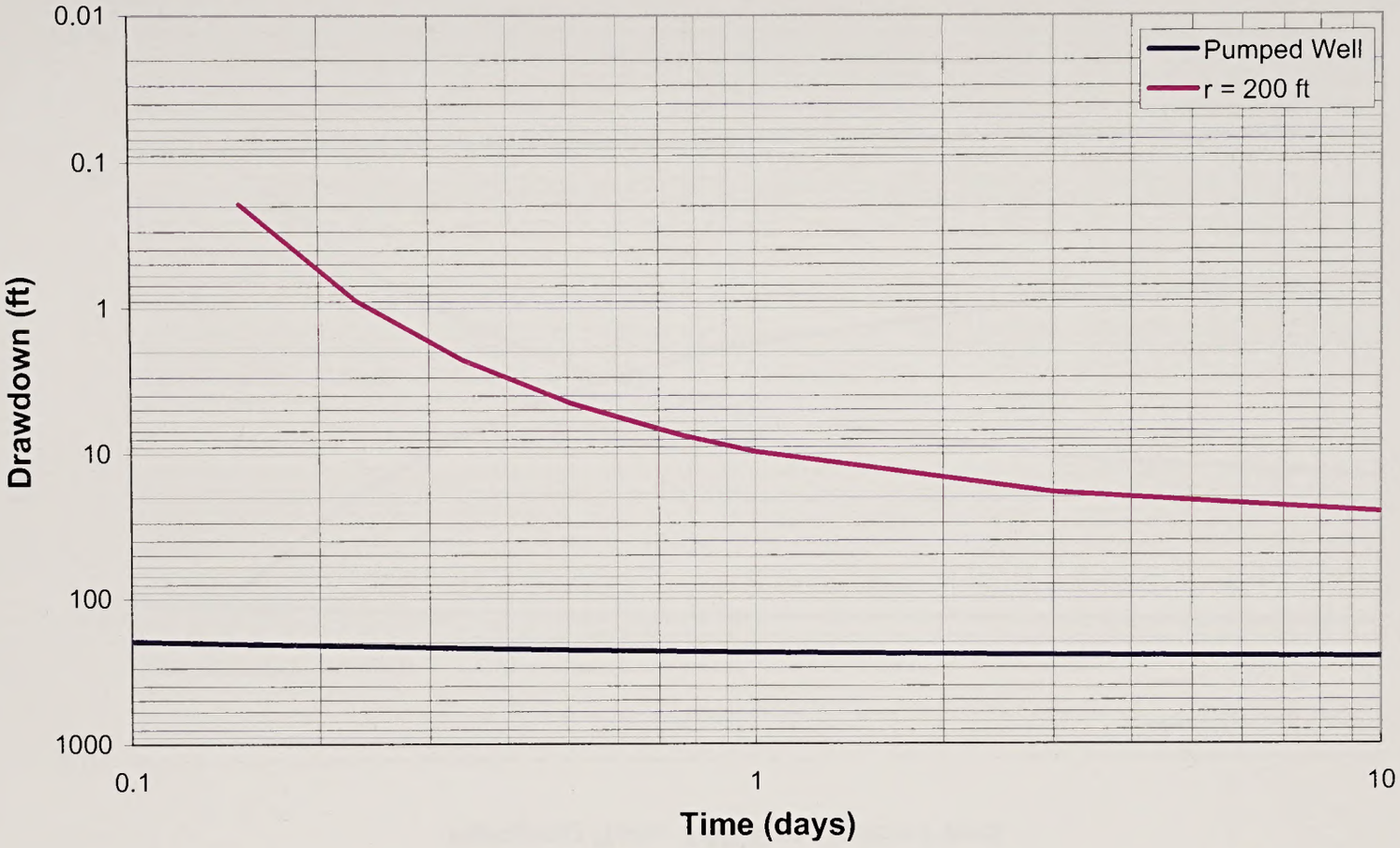


Figure 12 -- Drawdown for 600-Foot Well (First Design) with 240 Gallons per Minute Pumping Rate, 2 Million Gallon Pond.

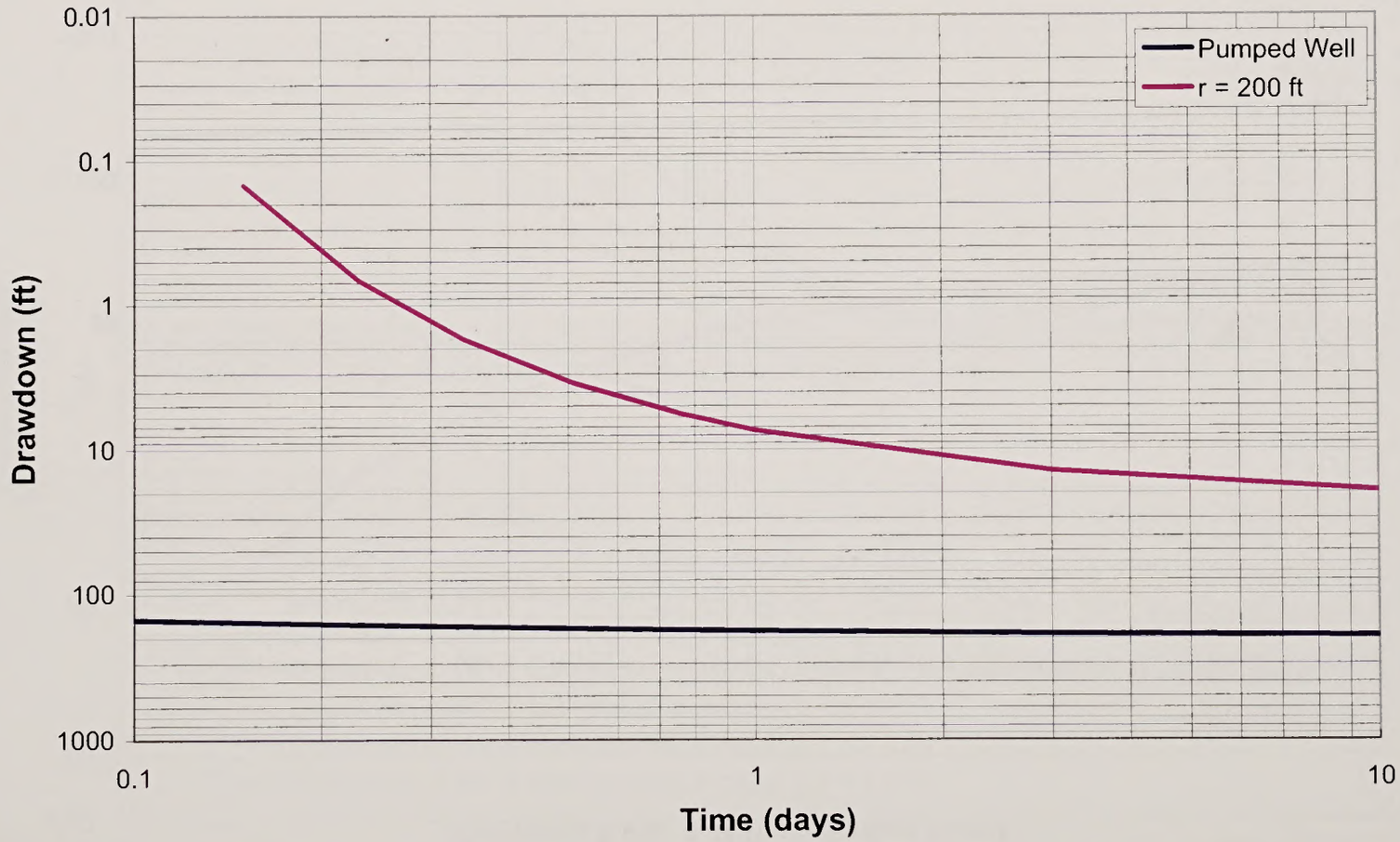


Figure 13 -- Drawdown for 600-Foot Well (First Design) with 175 Gallons per Minute Pumping Rate, 3 Million Gallon Pond.

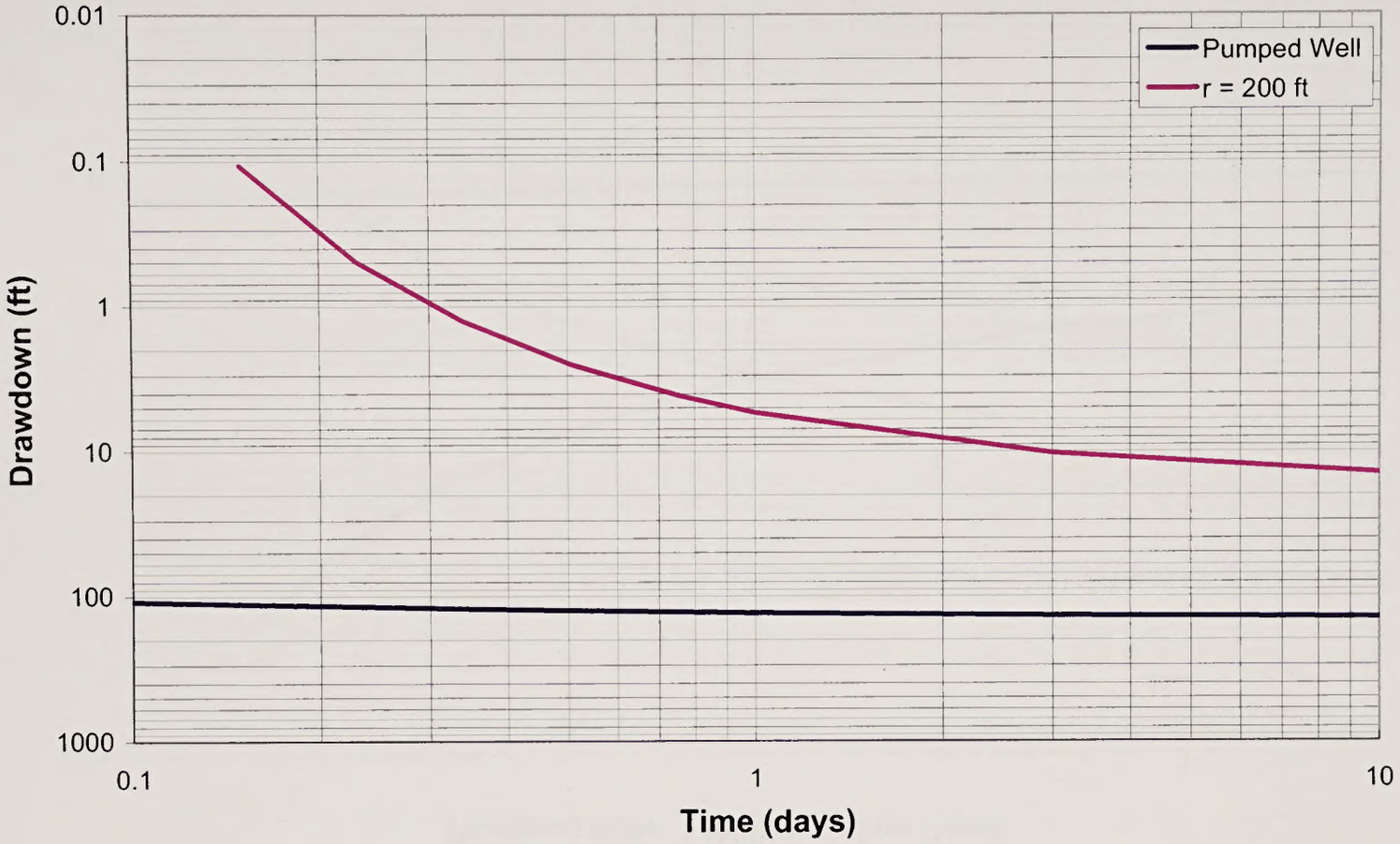


Figure 14 -- Drawdown for 800-Foot Well (Second Design) with 315 Gallons per Minute Pumping Rate, 1 Million Gallon Pond.

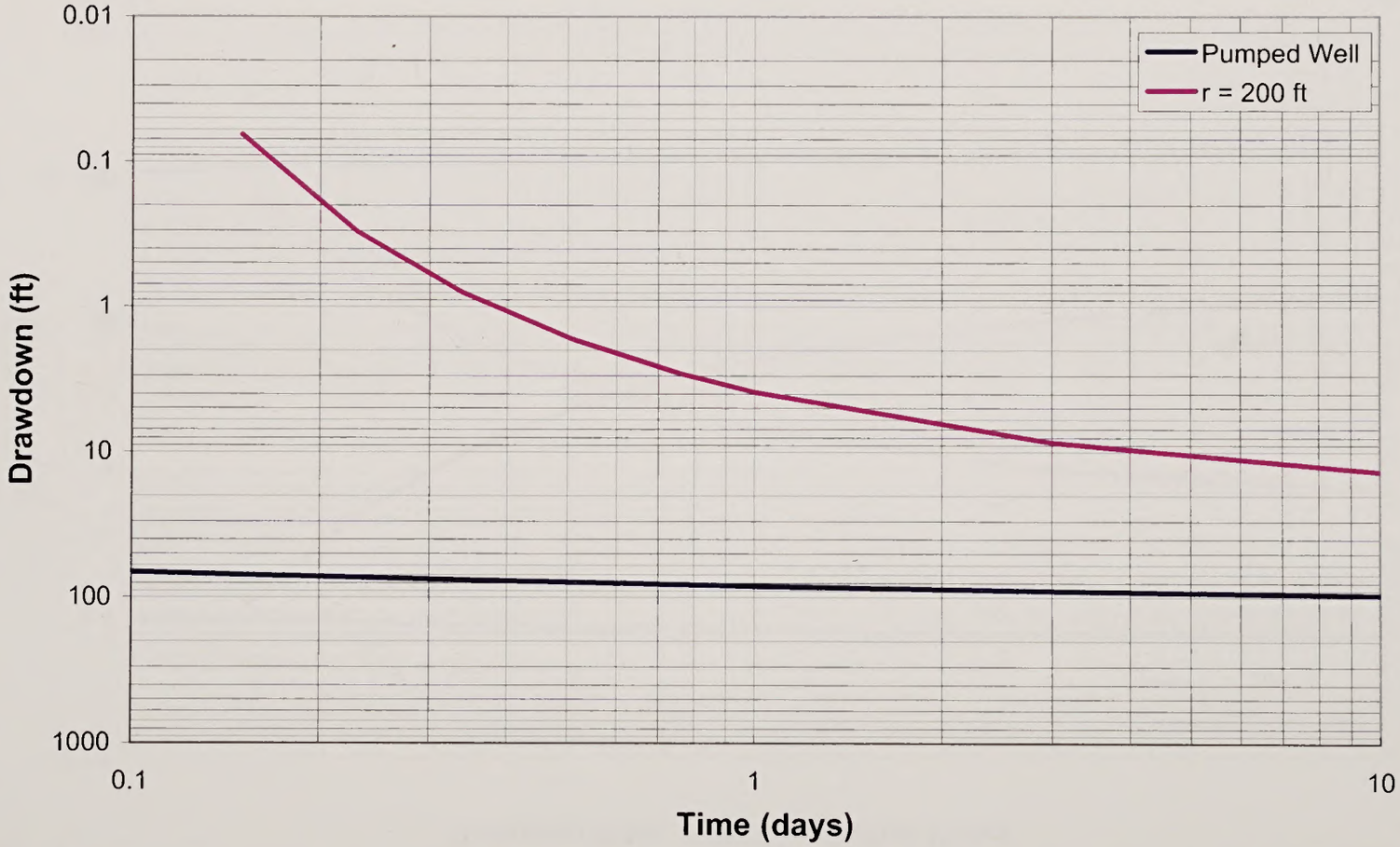


Figure 15 -- Drawdown for 800-Foot Well (Second Design) with 240 Gallons per Minute Pumping Rate, 2 Million Gallon Pond.

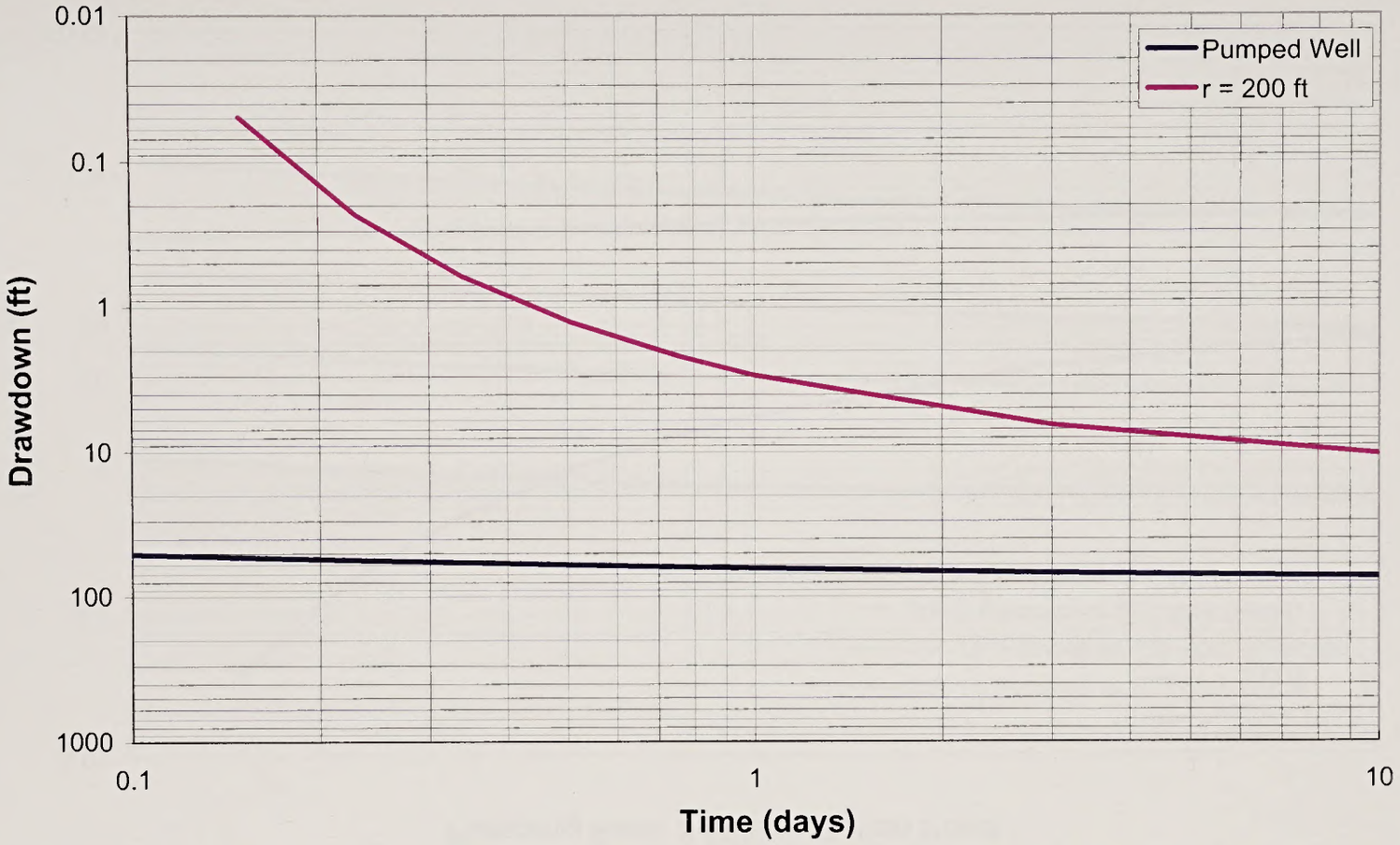


Figure 16 -- Drawdown for 800-Foot Well (Second Design) with 175 Gallons per Minute Pumping Rate, 3 Million Gallon Pond.

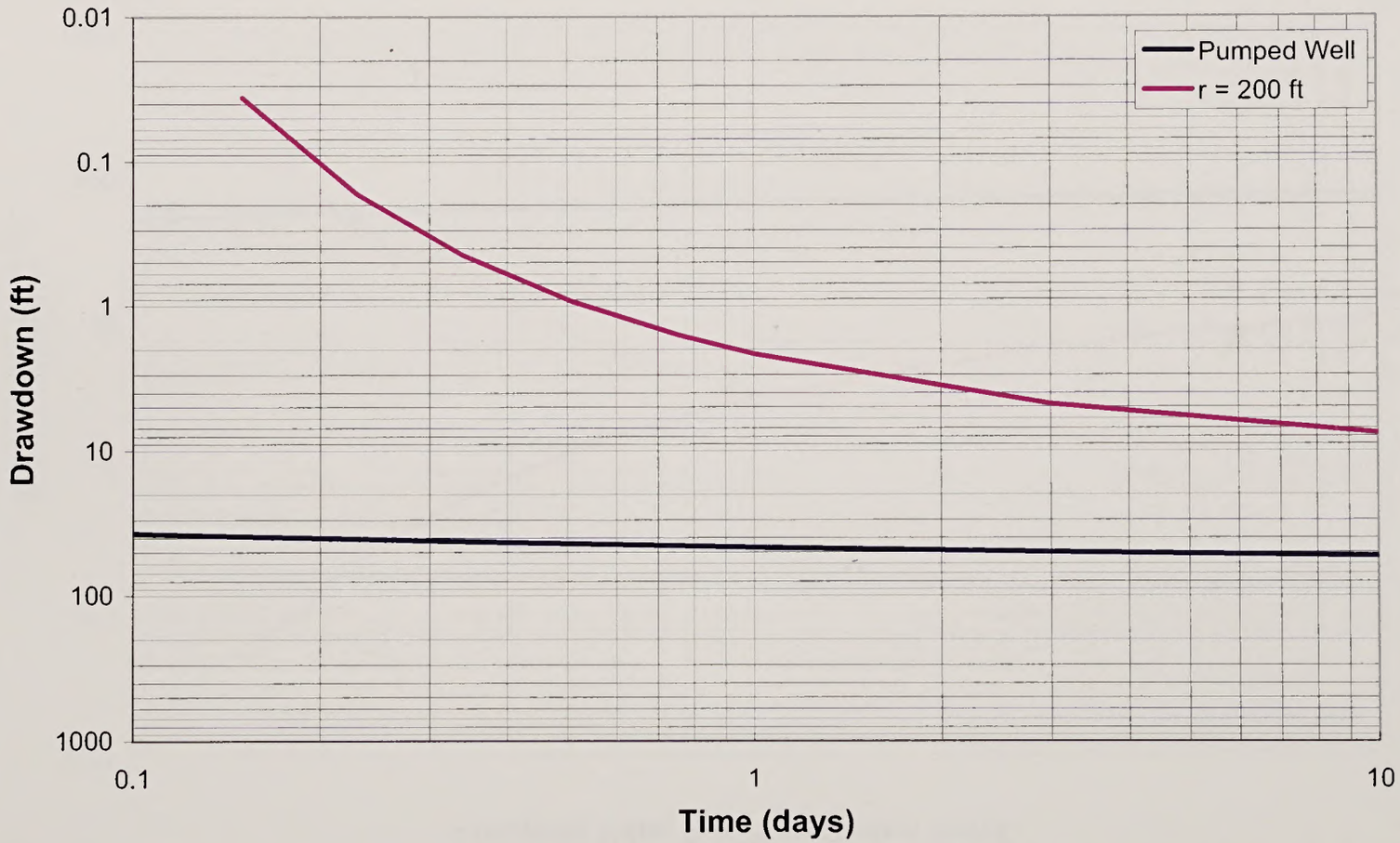
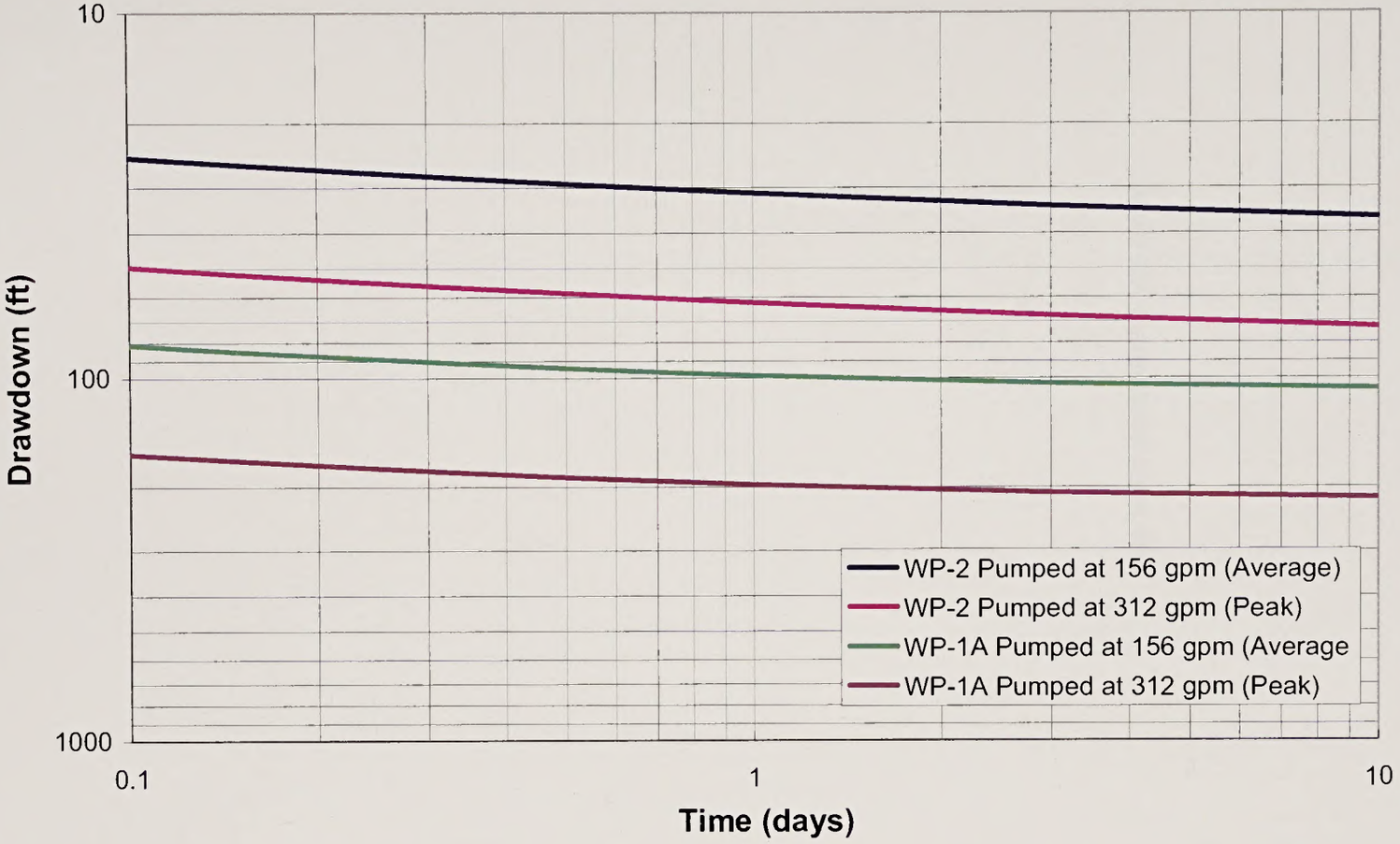


Figure 17 -- Drawdown for Nevada Energy Wells WP-1A and WP-2 Pumped for Ten Days, Average and Peak Values.



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F Draft EIS Public Comments and BLM Responses

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Appendix F

Table of Contents

Section **Page**

1.0 Silver State Solar Project Draft EIS Comment Analysis Process F-1

1.1 Introduction F-1

1.2 The Public Comment Process under NEPA F-2

1.3 Overview of Comments Received F-2

1.4 Process for Tracking and Analyzing Public Comments F-2

1.5 Content Analysis Annotation F-3

2.0 Key Issues Summary F-5

3.0 Analysis of Letters and Comments F-5

4.0 Public Comments and Responses F-6

List of Tables

Table **Page**

F-1 Log of Comments Received F-3

F-2 Individual Comments by Key Issue F-5

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Draft EIS Comment Letters and BLMs Responses

1.0 Silver State Solar Project Draft EIS Comment Analysis Process

1.1 Introduction

In April 2010, the Bureau of Land Management (BLM), Las Vegas Field Office (LVFO) released a Draft Environmental Impact Statement (DEIS) for the proposed Silver State Valley Solar Project. On April 16, 2010, a Notice of Availability (NOA) Silver State Solar Project Draft Environmental Impact Statement for public review and comment on the DEIS was published in the *Federal Register* (Vol. 75, No. 73, pp. 19990-1). The DEIS was distributed in both hard copy and on CD-ROM and was available for downloading from the BLM's Web site at http://www.blm.gov/nv/st/en/fo/lvfo/blm_programs/energy/nextlight_renewable0.htmll.

Additional copies of these volumes were made available for public inspection at the BLM Southern Nevada District Office at 4701 North Torrey Pines Drive, Las Vegas, Nevada 89130–2301,. The BLM invited public and agency comment on the DEIS and technical support documents for a period of 45 calendar days, which was scheduled to end on May 31, 2010.

A news release containing the dates, times, and locations of public comment meetings was provided by the BLM at the beginning of the DEIS comment period; and the DEIS was distributed to interested parties identified in the updated EIS mailing list. Three public meetings were held May 11-13, 2010 in Primm, Henderson (Las Vegas), and Jean, Nevada to explain the findings of the DEIS and obtain public comments. Comments could also be submitted in the following ways:

- via the Web site: http://www.blm.gov/nv/st/en/prog/energy/fasttrack_renewable.html.
- E-mail:nextlight_primm_nv_sep@blm.gov.
- Mail: Gregory Helseth, Renewable Energy Project Manager, BLM Pahrump Field Office, 4701 North Torrey Pines Drive, Las Vegas, Nevada 89130–2301.

The purpose of this narrative summary is to provide the numbers and types of comments that were received during the comment period for the DEIS and to describe the process by which all comments were analyzed to determine their relevance and significance for subsequent revision of the document. In addition, this summary describes the comment tracking procedures used for preparing the Final EIS, along with the organization of Appendix F, to assist the reader in locating specific letters/comments and BLM responses.

The DEIS review period was initiated by publication of the Notice of Availability (NOA) for the DEIS in the *Federal Register*. The DEIS was distributed as follows:

- The NOA was published on April 16, 2010, in the *Federal Register* specifying dates for the comment period (75 FR 73: 19990-1);
- A news release containing the dates, times, and locations of public comment meetings was provided by the BLM at the beginning of the comment period on the DEIS. The news release

was submitted to the same news organizations as for the initial public scoping announcement; and

- The DEIS was distributed to interested parties identified in the updated EIS mailing list and also made available via the Internet.

Thirty-three (33) comment letters were received during the 45-day public comment period. The BLM reviewed each comment and developed responses to all substantive comments based on guidance found in the Council on Environmental Quality (CEQ) regulations (40 CFR 1503.4.) As a result of this review, the EIS has been modified to supplement and improve the analysis. A compilation of the comment letters and BLM's responses are provided in Appendix F.

Three public meetings were held May 11 through 13, 2010, in Primm, Henderson (Las Vegas), and Jean, Nevada, to explain the findings of the DEIS and obtain public comments. Meeting locations, dates, and numbers of attendees are provided below:

Location	Date	No. of Attendees
Primm	May 11, 2010	8
Henderson/Las Vegas	May 12, 2010	20
Jean	May 13, 2010	13

1.2 The Public Comment Process under NEPA

Solicitation of public comment on draft plans for major federal actions is required under the National Environmental Policy Act (NEPA). Specifically, the BLM and other federal agencies must "assess and consider [the resulting public] comments both individually and collectively" (Title 40, Code of Federal Regulations [CFR], Section 1503.4). Comments received on the Silver State Solar Project DEIS are viewed as critical to helping the BLM modify or clarify, as necessary, the existing alternatives and the preferred alternative to best suit the purpose and need for the project in light of public, project applicant, and cooperating agency input; to potentially develop and evaluate new alternatives; to supplement, improve, or modify the existing environmental analyses; and to correct factual errors in the DEIS.

1.3 Overview of Comments Received

During the 45-day comment period for Silver State Project DEIS, the BLM received 27 individual written comments and 16 oral comments at the public meeting. Comments were received from federal, state, and local agencies, environmental advocacy groups, two law firms, the Applicant, and members of the public.

Comments by Submittal Type

The comments were divided into the following four groups:

1. Letters;
2. E-mails;
3. Oral public meeting comments; and
4. Written public meeting comments.

1.4 Process for Tracking and Analyzing Public Comments

Public comments play an integral role in the NEPA process. Comments to the Silver State Solar Project DEIS were categorized by their form of submittal: hard copy or electronic (e-mail) and were assigned sequential numbers for comment tracking purposes. The starting number for the DEIS comments immediately followed the last comment number from the Silver State Solar project scoping meetings.

The BLM analyzed each letter and oral public meeting comment to identify substantive comments through a process referred to as content analysis. Through this process, the BLM identified a total of 337 individual comments and assertions.

The comment organization of the letters, e-mails, and public meeting written and oral comments are shown in Table F-1 below.

1.5 Content Analysis Annotation

The Content Analysis process was used to identify significant comments and assertions that may require a response from the BLM. Public comments and assertions are identified electronically on the original correspondence, along with their unique identifier by highlighting individual comments. The letter identifier and comment number, and assertion number are annotated in the left margin of the correspondence or public meeting transcript.

Table F-1. Log of Comments Received

Comment Letter	Comment Number	Date Received	Agency, Organization, or Individual
Comment Letters			
0044	0044-1 to 0044-55	June 1, 2010	Bob Mrowka, Center for Biological Diversity
0045	0045-1 to 0045-13	May 31, 2010	Michael J. Connor, Western Watersheds Project
0046	0046-1 to 0046-18	May 28, 2010	Susan Wainscott, Desert Conservation Program
0047	0047-1 to 0047-4	May 28, 2010	Wendy Miler, Manager, Southern California Edison
0048	0048-1 to 0048-2	May 31, 2010	Robert E. Swadkins, Vice President of Finance, Primm Valley Resorts
0048	0049-1 to 0049-3	May 25, 2010	Brendan Hughes
0052	0052-1 to 0052-10	June 2, 2010	Lewis Wallenmeyer, Director, Department of air Quality & Environmental Management, Clark County, Nevada
0053	0053-1	May 27, 2010	Eddie LeMaire
0054	0054-1 to 0054-67	May 29, 2010	Kevin Emmerich and Laura Cunningham, Basin and Range Watch
0055	0055-01	May 31, 2010	Greg Seymour, Renewable Energy Program Coordinator, Nevada Wilderness Project
0056	0056-1 to 0056-29	May 31, 2010	Marilyn L, Skender, Attorney and Counsellor at Law
0057	0057-1	May 10, 2010	Arthur and Roy Rinehard
0058	0058-1	No Date	Dean Davis
0059	0059-1	Can't Read Date	Paul Evola
0060	0060-1	May 17, 2010	Ivan Jenner
0061	0061-1	May 11, 2010	Walter Martin
0062	0062-1	May 14, 2010	Robin Miller
0063	0063-1 to 0063-4	April 28, 2010	Steve Shell, Staff Engineer, Nevada Division of Water Resources
0067	0067-1 to 0067-30	June 1, 2010	Jeff Aardahl, Defenders of Wildlife
0068	0068-1 to 0068-9	June 1, 2010	John E. Hiatt, Conservation Chair, Red Rock Audubon Society
0070	0070-1 to 0070-52	June 2, 2010	Enrique Manzanilla, Director, Commutities and Ecosystem Division, United States Environmental Protection Agency
0071	0071-1 to 0071-3	June 1, 2010	Robert D. Williams, United States Department of the Interio Fish and Wildlife Service
0072	0072-1	June 1, 2010	Sally J. Armstrong, Edwin G. Armstrong, Melanie J. Armstrong and Pamela J. Hamman
0073	0073-1	June 1, 2010	Jared Fuller

Table F-1. Log of Comments Received

Comment Letter	Comment Number	Date Received	Agency, Organization, or Individual
Comment Letters			
0074	0074-1 to 0074-40	May 25, 2010	Teresa R. Motley, Clark County Department of Aviation
0075	0075-1 to 0075-3	June 1, 2010	Linda M. Bullen, Lionel Sawyer & Collins Attorneys at Law
0076	0076-1 to 0076-10	June 16, 2010	Starla Lacy, Executive, Environmental, Health and Safety,NV Energy
Public Meeting (Oral Comments)			
0064	0064-1	May 12, 2010	James Halsey
0064	0064-2 to 0064-8	May 12, 2010	Kevin Emmerick
0064	0064-9 to 0064-12	May 12, 2010	Laura Cunningham
0064	0064-13	May 12, 2010	Don Wall
0064	0064-14 to 0064-16	May 12, 2010	Rob Mrowka
0064	0064-18	May 12, 2010	Tina Past
0065	0065-1	May 13, 2010	Chris Wile
0065	0065-2	May 13, 2010	Don Reid
0065	0065-3	May 13, 2010	Sinisha Mandich
0065	0065-4	May 13, 2010	Walter Martine
0065	0065-5	May 13, 2010	Roger Peeples
0065	0065-6	May 13, 2010	Wayne Walters
0066	0066-1 to 0066-2	May 13, 2010	John Tull
0066	0066-3	May 13, 2010	Scott Rutledge
0066	0066-4	May 13, 2010	Edward Gering

2.0 Key Issue Summary

Comments received by the BLM during the scoping process provided a mechanism for identifying key issues regarding the Proposed Action and these comments are provided in the Scoping Summary Report (Appendix A). Comments received during public review of the Silver State Solar Project DEIS are contained in this appendix. In order to assist the reader in understanding these key issues and concerns, the following sections provide a summary of comments by major issue. Section 3 of this appendix also provides a discussion of how many public comments were directed to each of the major issue areas that are summarized below.

3.0 Analysis of Letters and Comments

As noted above, the BLM received 27 comment letters and 15 oral comments from the public meeting. The comments were further categorized, as illustrated in Table F-2. Individual Comments by Key Issue.

Table F-2. Individual Comments by Key Issue

Key Issue	*Number of Comments*
Agency Consultation	0
Alternatives	25
Climate Change	3
Regulatory Process and Public Involvement	0
Consistency	4
Project Design	8
Project Description	15
Purpose And Need	5
Aesthetics	0
Biological Resources	60
Biology Desert Tortoise	38
Biology Terrestrial	0
Biology Plants	20
Biology General	3
Invasive Plants, Noxious Weeds	1
Visual Resources	13
Cultural Resources	4
Paleontology	0
Geologic Resources	1
Greenhouse Gasses	6

Table F-2. Individual Comments by Key Issue

Key Issue	*Number of Comments*
Growth Inducing Effects	2
Grazing	5
Cumulative	19
Impact Assessment – Generally	0
Hazardous Materials	8
Environmental Justice	0
Land Use	4
Oceanography and Meteorology	0
Noise and Vibration	0
Maps	2
Socioeconomics	0
Soils	3
Transportation And Traffic	9
Water Quality and Hydrology	5
Wildland Fire and Fuels Management	10
Public Health and Safety	0
Special Management Areas	0
Recreation	5
Mitigation	11
General, does not support	3
General	49
Other	0
Total Number of Comments	*337*

4.0 Public Comments and Responses

All public comments received and BLM's responses are shown on the pages that follow.

CENTER for BIOLOGICAL DIVERSITY Because life is good.

Bureau of Land Management – Southern Nevada District
Attn: Mr. Greg Helseth, Renewable Energy Project Manager
4701 North Torrey Pines Dr.
Las Vegas, NV 89130-2301

June 1, 2010

Sent via e-mail: nextlight_primm_nv_sep@blm.gov

RE: Silver State Solar Project Draft Environmental Impact Statement

Dear Mr. Helseth:

On behalf of the Center for Biological Diversity ("Center"), please accept these comments on the Silver State Solar Project Draft Environmental Impact Statement ("DEIS"). We incorporate by reference our earlier scoping comments provided on July 30, 2009 and September 29, 2009.

The Center is a non-profit, public interest environmental organization dedicated to the protection of native species and their habitats through science, policy, and environmental law. The Center has over 255,000 members and on-line activists throughout Nevada and the United States.

We submit these comments on behalf of our members, activists, staff, and members of the general public who are interested in protecting native species and their habitats on Bureau of Land Management (BLM) lands in Nevada including those public lands that would be impacted by the proposed action.

The development of renewable energy is a critical component of efforts to reduce greenhouse gas emissions, avoid the worst consequences of global warming, and to assist Nevada and the nation with achieving emission reductions and renewable energy portfolio goals. The Center strongly supports the development of renewable energy production, and the generation of electricity from solar power, in particular. However, like any project, proposed solar power projects should be thoughtfully planned to minimize impacts to the environment. In particular, renewable energy projects should avoid impacts to sensitive species and habitat, and should be sited in proximity to the areas of electricity end-use in order to reduce the need for extensive new transmission corridors and the efficiency loss associated with extended energy transmission. Only by maintaining the highest environmental standards with regard to local impacts, and effects on species and habitat, can renewable energy production be truly sustainable.

Unfortunately, the proposed project is situated on largely undisturbed desert lands that support moderate to high densities of the federally threatened desert tortoise and as currently envisioned would require the destruction of prime tortoise habitat and the displacement and translocation of an estimated 88 current resident tortoises. Further, it is located in the Ivanpah Valley, which extends into California, where other renewable energy projects will have similar deleterious impacts on desert tortoises and other rare species. Indeed, directly south of the proposed project and the Nevada-California state line lies desert tortoise critical habitat and the Ivanpah Desert Wildlife Management Area (DWMA), which was designated by BLM as a conservation area for the imperiled desert tortoise. The same prime habitat extends north into the proposed project

0044-1

Arizona · California · Nevada · New Mexico · Alaska · Oregon · Montana · Illinois · Minnesota · Vermont · Washington, DC
4261 Lily Glen Ct · Las Vegas, NV 89032 tel: (702) 249.5821 fax: (702) 638.4261 www.BiologicalDiversity.org

0044-1
General
Your statement is included in the public record and will be taken into account by decision-makers when they consider the proposed project.

area and is of equal value to the tortoise. It simply lacks the jurisdictional designation of DWMA because of previous political, not biological reasons.

It is with this background that we submit the following comments on the DEIS and express our concerns.

I. The BLM's Analysis of the Proposed Project Fails to Comply with the Federal Land Policy Management Act ("FLPMA").

All BLM actions must be consistent with FLPMA (43 U.S.C. § 1701 *et seq.*) In accordance with FLPMA, public lands are to be managed on the basis of multiple use and sustainable yield. 43 U.S.C. § 1701(a)(7). Furthermore, land managers are to take into account the long-term needs of future generations for renewable and non-renewable resources, including fish and wildlife. *See* 43 U.S.C. ss1702(c); 43 U.S.C. § 1711(a)(8). FLPMA further declares public lands are to be managed for multiple uses "in a manner that will protect the quality of the scientific, scenic, historical, ecological, environmental, air and atmospheric, water resource, and archeological values." 43 U.S.C.§ 1701(a)(7) & (8). In this DEIS the BLM has failed to comply with the requirements of FLPMA. 0044-2

1. *Fails to Adequately Address Other Ongoing Planning Efforts.*

The DEIS fails to adequately address the proposed project in the context of other connected projects (including multiple solar projects, substations and additional transmission lines) that if approved will create a *de facto* "solar zone" in this area undermining the ongoing PEIS planning process for solar development in six western states undertaken by BLM and DOE. As the BLM is well aware, the Ivanpah Valley area was *not* proposed as a solar development study area in that PEIS for either California or Nevada. Direct, indirect and cumulative impacts of the proposed project will convert the Northern Ivanpah Valley in California as well as Nevada into a *de facto* solar-industrial zone. 0044-3

The cumulative impacts to species across the zone and across the state line into the Ivanpah Valley in California are not adequately addressed in the planning context. Nor is the conversion of a largely natural area – the Ivanpah Valley and dry lake area as a whole—into a largely industrialized area with more than 6 large scale solar plants, the accompanying substations and power lines, and the glare and heat islands that will be created across the "zone" adequately addressed in the environmental review. In fact, it is clear that piecemeal project approvals in this area undermines the solar programmatic planning by federal agencies for the western states. This critical issue regarding planning on public lands is not adequately addressed in the DEIS which in fact fails to even mention the PEIS process. The BLM does not analyze how the PEIS could be affected by piecemeal approval of this and other projects. This is not consistent with the planning requirements of FLPMA or, indeed, any rational land use planning principles. 0044-4

2. *BLM Failed to Adequately Inventory the Resources of These Federal Lands Before Preparing this DEIS.*

0044-2
Biological Resources
The DEIS is in compliance with FLPMA 43 U.S.C.§ 1701(a)(7) & (8)

0044-3
General
The DEIS considered all projects that are reasonably expected to have a cumulative impact, including other solar and electrical transmission projects in the Ivanpah Valley. These projects do not constitute connected actions as they are proposed by other entities and are being analyzed through other NEPA and California Environmental Quality Act projects.

0044-4
Cumulative Impacts
The BLM determined that it was in the national interest to proceed with the Silver State Solar Project EIS concurrently with the Solar Programmatic EIS. The cumulative impacts associated with all reasonably foreseeable solar and other projects in the region were considered in the Silver State Solar Project DEIS.

FLPMA states that "[t]he Secretary shall prepare and maintain on a continuing basis an inventory of all public lands and their resource and other values," and this "[t]his inventory shall be kept current so as to reflect changes in conditions and to identify new and emerging resource and other values." 43 U.S.C. § 1711(a). FLPMA also requires that this inventory form the basis of the land use planning process. 43 U.S.C. § 1701(a)(2). *See Center for Biological Diversity v. Bureau of Land Management*, 422 F.Supp.2d 1115, 1166-67 (N.D. Cal. 2006) (discussing need for BLM to take into account known resources in making management decisions); *Or. Natural Desert Ass'n v. Rasmussen,* 451 F.Supp. 2d 1202, 1212-13 (D. Or. 2006) (finding that BLM did not take a hard look under NEPA by relying on outdated inventories and such reliance was inconsistent with BLM's statutory obligations to engage in a continuing inventory under FLPMA). It is clear that BLM should not approve a project that would undermine future planning in this area based on outdated and inadequate inventories of affected resources on public lands.

As detailed below in the NEPA sections, here BLM has failed to compile an adequate inventory of the resources of the public lands that could be affected by the proposed project (including, e.g., late-summer/early-fall flowering plants, spring time use by desert tortoises, reptiles and bird and other biological resources on site) which is necessary in order to adequately assess the impacts to resources of these public lands in light of the proposed project and the connected actions. In fact, the DEIS has even failed to adequately analyze impacts on known resources.

3. *The DEIS Fails to Provide Adequate Information to Ensure that the BLM will Prevent Unnecessary and Undue Degradation of Public lands*

FLPMA requires BLM to "take any action necessary to prevent unnecessary or undue degradation of the lands" and "minimize adverse impacts on the natural, environmental, scientific, cultural, and other resources and values (including fish and wildlife habitat) of the public lands involved." 43 U.S.C. §§ 1732(b), 1732(d)(2)(a). Without adequate information and analysis of the current status of the resources of these public lands, BLM cannot fulfill its duty to prevent unnecessary or undue degradation of the public lands. Thus, the failure to provide an adequate current inventory of resources and environmental review undermines BLM's ability to protect and manage these lands in accordance with the statutory directive.

BLM has failed to properly identify and analyze impacts to the resources including the listed and sensitive species in the project area. As detailed below, the BLM's failure in this regard violates the most basic requirements of NEPA and in addition undermines the BLM's ability to ensure that the proposal does not cause unnecessary and undue degradation of public lands. *See Island Mountain Protectors*, 144 IBLA 168, 202 (1998) (holding that "[t]o the extent BLM failed to meet its obligations under NEPA, it also failed to protect public lands from unnecessary or undue degradation."); *National Wildlife Federation*, 140 IBLA 85, 101 (1997) (holding that "BLM violated FLPMA, because it failed to engage in any reasoned or informed decision making process" or show that it had "balanced competing resource values").

II. The DEIS Fails to Comply with NEPA.

NEPA is the "basic charter for protection of the environment." 40 C.F.R. § 1500.1(a). In NEPA, Congress declared a national policy of "creat[ing] and maintain[ing] conditions under which man and nature can exist in productive harmony." *Or. Natural Desert Ass'n v. Bureau of Land Mgmt.*, 531 F.3d 1114, 1120 (9th Cir. 2008) (quoting 42 U.S.C. § 4331(a)). NEPA is intended to "ensure that [federal agencies] ... will have detailed information concerning significant environmental impacts" and "guarantee[] that the relevant information will be made available to the larger [public] audience." *Blue Mountains Biodiversity Project v. Blackwood,* 161 F.3d 1208, 1212 (9th Cir. 1998).

Under NEPA, before a federal agency takes a "'major [f]ederal action[] significantly affecting the quality' of the environment," the agency must prepare an environmental impact statement (EIS). *Kern v. U.S. Bureau of Land Mgmt.*, 284 F.3d 1062, 1067 (9th Cir. 2002) (quoting 43 U.S.C. § 4332(2)(C)). "An EIS is a thorough analysis of the potential environmental impact that 'provide[s] full and fair discussion of significant environmental impacts and ... inform[s] decisionmakers and the public of the reasonable alternatives which would avoid or minimize adverse impacts or enhance the quality of the human environment.'" *Klamath-Siskiyou Wildlands Ctr. v. Bureau of Land Mgmt.*, 387 F.3d 989, 993 (9th Cir. 2004) (citing 40 C.F.R. § 1502.1). An EIS is NEPA's "chief tool" and is "designed as an 'action-forcing device to [e]nsure that the policies and goals defined in the Act are infused into the ongoing programs and actions of the Federal Government.'" *Or. Natural Desert Ass'n,* 531 F.3d at 1121 (quoting 40 C.F.R. § 1502.1).

An EIS must identify and analyze the direct, indirect, and cumulative effects of the proposed action. This requires more than "general statements about possible effects and some risk" or simply conclusory statements regarding the impacts of a project. *Klamath Siskiyou Wildlands Center v. BLM,* 387 F.3d 989, 995 (9th Cir. 2004) (citation omitted); *Oregon Natural Resources Council v. BLM,* 470 F.3d 818, 822-23 (9th Cir. 2006). Conclusory statements alone "do not equip a decisionmaker to make an informed decision about alternative courses of action or a court to review the Secretary's reasoning." *NRDC v. Hodel*, 865 F.2d 288, 298 (D.C. Cir. 1988).

NEPA also requires BLM to ensure the scientific integrity and accuracy of the information used in its decision-making. 40 CFR § 1502.24. The regulations specify that the agency "must insure that environmental information is available to public officials and citizens before decisions are made and before actions are taken. The information must be of high quality. Accurate scientific analysis, expert agency comments, and public scrutiny are essential." 40 C.F.R. § 1500.1(b). Where complete data is unavailable, the EIS also must contain an analysis of the worst-case scenario resulting from the proposed project. *Friends of Endangered Species v. Jantzen*, 760 F.3d 976, 988 (9th Cir. 1985) (NEPA requires a worst case analysis when information relevant to impacts is essential and not known and the costs of obtaining the information are exorbitant or the means of obtaining it are not known) *citing Save our Ecosystems v. Clark*, 747 F.2d 1240, 1243 (9th Cir. 1984); 40 C.F.R. § 1502.22.

As detailed below, the DEIS fails to comply with NEPA in several key areas. Overall, that the DEIS provides incomplete information and appears to have been prepared in a rush rather than to

be the result of adequate analysis and research regarding impacts to the environment. Moreover, the DEIS fails to meet the requirements for sufficient information in many ways and fails to include any explanation for the missing information or analysis of why it could not be obtained. The Center is well aware that deadlines for funding, particularly for the American Recovery and Reinvestment Act ("ARRA") funds, have driven the pace of the environmental review for this project and, while we support such funding mechanisms, deadlines cannot be used as an excuse for rushed and inadequate NEPA review. The BLM and DOE must be concerned with the adequate NEPA review and even if the agencies can properly have an objective of *timely* approval of projects they cannot properly have as purpose and need of the project a *rushed* inadequate environmental impact review.

1. Project Description and Segmentation.

NEPA's implementing regulations explain that agencies should consider connected, cumulative, and similar actions in the same impacts statement. "Connected actions" must "be considered together in a single EIS." *Thomas v. Peterson*, 753 F.2d 754, 758 (9th Cir. 1985); 40 C.F.R. § 1508.25(a)(1). Connected actions are those actions that:

> i. Automatically trigger other actions which may require environmental impact statements.
> ii. Cannot or will not proceed unless other actions are taken previously or simultaneously.
> iii. Are interdependent parts of a larger action and depend on the larger action for their justification.

40 C.F.R. § 1508.25(a)(1). Where two actions are "inextricably intertwined" they are connected actions that must be considered together. *Thomas*, 753 F.2d at 759; *Save the Yaak Committee v. Block*, 840 F.2d 714, 720 (9th Cir. 1988). Likewise, cumulative actions "which when viewed with other proposed actions have cumulatively significant impacts [] should [] be discussed in the same impact statement." 40 C.F.R. § 1508.25(a)(2). Similar, reasonably foreseeable actions also should be considered together in the same environmental review document when the actions "have similarities that provide a basis for evaluating their environmental consequences together, such as common timing or geography," and the "best way to assess adequately [their] combined impacts [...] or reasonable alternatives" is to consider them together. 40 C.F.R. § 1508.25(a)(3).

The requirements that connected actions, cumulative, and/or similar actions be evaluated together prevents an agency from dividing a single project into segments that individually seem to have limited environmental impact, but as a whole have considerable impact. *See Thomas v. Peterson*, 753 F.2d at 758. It is important for federal agencies to consider connected actions together in a single NEPA process as opposed to segmenting review. *Daly v. Volpe*, 514 F.2d 1106, 1110 (9th Cir. 1975) (where actions are interconnected in terms of fulfilling a joint purpose it may be necessary to conduct a single NEPA review).

In light of the CEQ guidelines and the case law, the proposed Silver State project and the proposed Ivanpah Solar Electric Generating System project ("ISEGS") and the proposed Eldorado-Ivanpah Transmission Project ("EITP") should have been considered more fully in a

single environmental review. Had BLM done so, it would have properly framed the questions before it and would have fully considered the impacts to the Ivanpah Valley from the *de facto* solar zone that is being created in this area without any land use planning being undertaken and without consideration of the overall impacts of the proposed wide-spread, sprawling, large-scale industrialization of the Valley as a whole. 0044-5

Here, the BLM should not proceed any further in the NEPA process for the proposed project without an analysis of the direct and indirect impacts of the proposed project in conjunction with the proposed EITP line upgrade and substations that are *necessary for this proposed project* as well as the other proposed projects that will also connect to the same transmission line upgrade and substations and enable these solar projects to access the California market. At minimum, the BLM should consider all of the impacts of the proposed project, along with the transmission upgrade and substations, and the ISEGS that are also on the so called "fast track" as direct impacts of a connected project. Even if these significant impacts are described as indirect effects or "secondary" or "induced" effects attributable to the proposed project and the necessary transmission line upgrade, the need for adequate coordinated environmental review is no less. *See City of Davis v. Coleman*, 521 F.2d 661 (9th Cir. 1975) (requiring agency to prepare an EIS on effects of proposed freeway interchange on a major interstate highway in an agricultural area and to include a full analysis of both the environmental effects of the exchange itself and of the development potential that it would create). By failing to combine or coordinate this NEPA process with the approval process for all of the connected actions BLM may undermine full and fair public review of the impacts of the project in violation of NEPA. The mere fact that these projects cross state lines or BLM planning areas does not change the required NEPA standards or the need to consider the impacts of these projects together. BLM must disclose and consider all of the related and interconnected projects' significant impacts together. To do otherwise would be unlawful. Cumulative analysis is not sufficient where projects are connected actions and will result in a new industrial zone being created on public lands that now serve multiple uses including providing high-quality occupied habitat for a threatened species. 0044-6

In particular, the BLM should consider together the additive impacts to biological resources, including the desert tortoise and its habitat, from the proposed solar projects and the proposed transmission line and substations to ensure that the true extent of impacts are fully disclosed and analyzed. BLM should not treat this critical analysis as a cumulative impacts question alone. Because the currently proposed projects are linked and interdependent they should be evaluated together under NEPA. For example, each of these projects will have significant direct impacts on desert tortoise populations in the Northeastern Mojave Recovery Unit. BLM must look at those impacts in a comprehensive way that would allow it to formulate meaningful alternatives that could avoid many of the impacts of these linked projects and where impacts remain that cannot be avoided through alternatives, provide for comprehensive minimization and mitigation measures that will ensure that impacts to this recovery unit are appropriately mitigated. Ultimately, BLM must ensure that the approval of these linked projects does not impair the recovery of the desert tortoise populations in the Northeastern Mojave Recovery Unit. 0044-7

The proposal would require changes in the motorized recreation route network resulting in at least one route which would need to be moved—those changes to the route network are not reflected clearly in the DEIS (nor are the likely direct, indirect and cumulative impacts of 0044-8

0044-5
Cumulative Impacts
The EIS adequately considers the direct, indirect and cumulative impacts that would occur from the Silver State Solar project and other projects in the Ivanpah Valley, including potential impacts from the Eldorado to Ivanpah Transmission and Ivanpah Solar Electric Generation System (ISEGS) Projects.

0044-6
Cumulative Impacts
The Eldorado to Ivanpah Transmission Project (EITP) was planned for several years prior to this project and is not the only option to off-take electrical energy generated in the area. In fact, the first power purchase agreement for the Silver State Solar project is with NVEnergy whose line does not need upgrades to deliver the power to its customers.

0044-7
Biology - Desert Tortoise
Section 4.19.6 Biological Resources The analysis of cumulative impacts to desert tortoise in the FEIS was revised to incorporate an analysis of how the Proposed Project and the other planned projects will impacts the Northeastern Mojave Recovery Unit.

0044-8
Biological Resources
Please see Section 4.11 Recreation
Impacts to recreation have been revised.

changing those route designations adequately identified or analyzed). The DEIS simply concludes: "Under Alternatives 2 and 3, there would be a change in existing access to the Jean Lake/Roach Lake Special Recreation Management Area ("SRMA") since a portion of this SRMA would no longer be open to the public. In addition, both alternatives would result in an increase in the level of use of other parts of the Jean Lake/Roach Lake SRMA by members of the public engaged in recreational model rocket launching, movie, commercial, and music video filming, big game hunting, horseback riding events, hiking, and music festivals since a portion of the SRMA would no longer be available to the public.." [1] There is no discussion of how the changes in access could affect other resources such as desert tortoise. Moreover, because these routes are part of a network and "rerouting" them along the fence line of a major industrial installation will undoubtedly change use of the previously existing routes and most likely cause increased use on other nearby routes, new unauthorized routes that will provide connections to the other routes, and/or entirely new unauthorized routes to be created to avoid the industrial site entirely. There is no evidence that recreational off-road vehicle users will be content to drive for miles along a fence adjoining an industrial site rather than striking off cross-country to connect with more scenic routes. Past experience shows that the latter is quite understandably a much more likely outcome and BLM should recognize this in analyzing the impacts of this project.

Because an accurate project description is vital to a fair comparison of alternatives, the DEIS should have more clearly discussed the capacity factor of the proposed technology and other potential energy losses so that the actual output of this proposed project could be compared to similar projects.

2. The Range of Alternatives in the DEIS is Artificially Narrow and Constrained.

NEPA requires that an EIS contain a discussion of the "alternatives to the proposed action." 42 U.S.C. §§ 4332(C)(iii),(E). The discussion of alternatives is at "the heart" of the NEPA process, and is intended to provide a "clear basis for choice among options by the decisionmaker and the public." 40 C.F.R. §1502.14; *Idaho Sporting Congress*, 222 F.3d at 567 (compliance with NEPA's procedures "is not an end in itself . . . [but] it is through NEPA's action forcing procedures that the sweeping policy goals announced in § 101 of NEPA are realized.") (internal citations omitted). NEPA's regulations and Ninth Circuit caselaw require the agency to "rigorously explore" and objectively evaluate "all reasonable alternatives." 40 C.F.R. § 1502.14(a) (emphasis added); *Envtl. Prot. Info. Ctr. v. U.S. Forest Serv.*, 234 Fed. Appx. 440, 442 (9th Cir. 2007). "The purpose of NEPA's alternatives requirement is to ensure agencies do not undertake projects "without intense consideration of other more ecologically sound courses of action, including shelving the entire project, or of accomplishing the same result by entirely different means." *Envtl. Defense Fund, Inc. v. U.S. Army Corps of Engrs.*, 492 F.2d 1123, 1135 (5th Cir. 1974). An agency will be found in compliance with NEPA only when "all reasonable alternatives have been considered and an appropriate explanation is provided as to why an alternative was eliminated." *Native Ecosystems Council v. U.S. Forest Serv.*, 428 F.3d 1233, 1246 (9th Cir. 2005); *Bob Marshall Alliance v. Hodel*, 852 F.2d 1223, 1228-1229 (9th Cir. 1988). The courts, in the Ninth Circuit as elsewhere, have consistently held that an agency's failure to consider a reasonable alternative is fatal to an agency's NEPA analysis. *See, e.g.,*

[1] DEIS at 4-73.

Idaho Conserv. League v. Mumma, 956 F.2d 1508, 1519-20 (9th Cir. 1992) ("The existence of a viable, but unexamined alternative renders an environmental impact statement inadequate.").

In this DEIS the BLM carries three alternatives into full analysis – no action, the proposed, and the proposed with alternative drainage management and a larger footprint. It is only in the "executive summary" section where the BLM discloses that five other alternatives were considered but dismissed, and in dismissing them it does so with only sentence or two for each.[2]

If BLM rejects an alternative from consideration, it must explain why a particular option is not feasible and was therefore eliminated from further consideration. 40 C.F.R. § 1502.14(a). The courts will scrutinize this explanation to ensure that the reasons given are adequately supported by the record. *See Muckleshoot Indian Tribe v. U.S. Forest Service*, 177 F.3d 800, 813-15 (9th Cir. 1999); *Idaho Conserv. League*, 956 F.2d at 1522 (while agencies can use criteria to determine which options to fully evaluate, those criteria are subject to judicial review); *Citizens for a Better Henderson*, 768 F.2d at 1057. The BLM has clearly failed to meet this requirement of law. 0044-9

BLM can, and indeed must, undertake full consideration of alternatives under NEPA when reviewing a proposed project and there are several potential alternatives that would have fallen well within BLM's jurisdiction including a plan amendment to promote conservation of the desert tortoise and protect the high-quality tortoise habitat in the Ivanpah Valley from industrial development. Furthermore, even if an alternative is outside of BLM's jurisdiction that does not mean that it should not be considered. Section 1502.14(c) of the NEPA regulations requires that the agency develop and evaluate reasonable alternatives that are not within the jurisdiction of the agency, and which are outside of the capability of the applicant to implement. 0044-10 0044-11

On-site Habitat Design Alternative

One alternative dismissed from consideration in the NEPA analysis was the retention of on-site habitat for desert tortoises, birds, badgers, Gila monsters, chuckwallas, and rare plants. A dismissed alternative named, "Alternative Project Design", was described in one sentence which stated that the arrays would be constructed 10 feet above the ground to minimize impacts to off-highway vehicles and vegetation.[3] It is dismissed with one sentence in the DEIS: "The alternative was eliminated from further analysis due to engineering and economic feasibility."[4] No documentation, analysis or support was provided for the BLM reaching this conclusion. 0044-12

While concerns about tortoise safety would need to be addressed to prevent or minimize take of tortoise by the ongoing use of vehicles to access the panels for cleaning, maintenance and replacement, maintaining some habitat values between the panels and/or sets of panels could likely continue to provide tortoise habitat and improve the chances of site restoration in the future. Such an alternative would include the setting of standards for the maintenance of on-site habitat for tortoises, raising panels above the height of existing vegetation, minimizing the

[2] DEIS, pages ES-4 & 5.
[3] DEIS, page ES-5.
[4] Ibid.

0044-9
Alternatives
The EIS did explain why these alternatives were considered infeasible and were eliminated from further analysis. See pages 2-5, 2-6 and 2-7.

0044-10
Alternatives
The purpose and need for the EIS project was to consider an application filed with the BLM for a right of way grant. A plan amendment was not considered within the purpose and need.

0044-11
Alternatives
That is correct. BLM can consider alternatives that are currently outside of its jurisdiction in an EIS. BLM only considered alternatives that satsified the purpose and need for the project, including compliance with FLPMA, and renewable energy goals of the Federal government.

0044-12
Alternatives
The EIS has been changed to explain why this alternative was not considered feasible and was eliminated from further analysis.

impacts from service roads by including tortoise fencing and tortoise underpasses, and perhaps increasing the distance between access roads, the elimination of mowing, and include a rigid monitoring and adaptive management plan. Such an approach could potentially minimize impacts to rare plant and animal species, native vegetation communities, and reducing the threats from noxious invasive plants and dust.

Other Alternatives that Should be Developed and Considered.

Other alternatives should have been explored that would have reduced the project footprint overall and thereby the need for translocation and the negative impacts it has for tortoise could be avoided. Translocation will be further discussed later in these comments. The Center implores the BLM to work with the proponent in developing additional alternatives that will minimize impacts to habitat as well as minimizing direct impacts to the desert tortoise and analyze then it in further NEPA review, either a revised DEIS or a supplemental DEIS.

At minimum, an alternative site outside of occupied desert tortoise habitat, a distributed power approach, a phased alternative, and a reduced size alternative, all should have been explored. While a distributed power system alternative may be outside the jurisdiction of the BLM, as previously noted, it is a reasonable expectation under NEPA. A phase-in alternative could be developed that would approve the project in phases in order to minimize impacts if unforeseen events occur and would also give the project proponent time to look for alternate sites for the remaining phases that are would have fewer impacts to the tortoise and other resources of these public lands. The proposed action envisions three phases, but only one approval point, precluding adaptive management which would allow BLM to incorporate lessons learned from earlier phases particularly regarding impacts to the tortoise effectively minimizing environmental impacts. 0044-13

A reduced sized project was dismissed because no comments were received during scoping. This is a rather narrow excuse considering that many comments were raised about the potential environmental impacts from the project, many of which could be minimized through changes in scale or project location. Because the alternatives analysis is the "heart" of any environmental review, the failure to provide meaningful alternatives is fatal to this DEIS. 0044-14

3. The DEIS Does Not Adequately Describe Environmental Baseline.

BLM is required to "describe the environment of the areas to be affected or created by the alternatives under consideration." 40 CFR § 1502.15. The establishment of the baseline conditions of the affected environment is a practical requirement of the NEPA process. In *Half Moon Bay Fisherman's Marketing Ass'n v. Carlucci*, 857 F.2d 505, 510 (9th Cir. 1988), the Ninth Circuit states that "without establishing . . . baseline conditions . . . there is simply no way to determine what effect [an action] will have on the environment, and consequently, no way to comply with NEPA." Similarly, without a clear understanding of the current status of these public lands BLM cannot make a rational decision regarding proposed project. *See Center for Biological Diversity v. U.S. Bureau of Land Management, et al.*, 422 F. Supp. 2d 1115, 1166-68 (N.D. Cal. 2006) (holding that it was arbitrary and capricious for BLM to approve a project

0044-13
Alternatives
During several pre-application meetings with BLM, it was determined that the proposed project site had the fewest known resource conflicts. While it was understood that desert tortoises occupy most of the Mojave Desert and this part of Nevada, the proposed project area is not within critical habitat or a Desert Wildlife Management Area. As required by NEPA, the EIS disclosed impacts to desert tortoises and proposed mitigation measures which will be taken into consideration in the decision making process.

0044-14
Alternatives
This was a mistatement. A reduced footprint (i.e., smaller sized facility) alternative was not considered in the EIS because the analysis did not identify any specific significant impacts that a smaller project would have avoided.

based on outdated and inaccurate information regarding biological resources found on public lands).

The DEIS fails to provide adequate baseline information and description of the environmental setting in many areas including the status of the desert tortoise and other sensitive and rare plant and animal communities.

The desert tortoise is protected under the federal Endangered Species Act (55 Fed. Reg. 12178 (1990)), and is sorely in need of additional protections to stem population declines due to ongoing threats. These issues should have been fully explored in the baseline discussion. The DEIS admits that the "The Proposed Project area contains good to excellent quality desert tortoise habitat due to its location within the Ivanpah Valley."[5] The DEIS briefly mentions the current status of the species but does not clarify the need for additional protective measures to ensure recovery. 0044-15

The DEIS minimizes the importance of this area for tortoise recovery but noting, "...the project is not located within the boundaries of any critical habitat area or DWMA/ACEC."[6], but fails to explain the history of the current designation. The project site has long been recognized as excellent and important desert tortoise habitat. Post listing in 1994, the Fish and Wildlife Service ("FWS") published a Recovery Plan for this threatened species that identified the Desert Wildlife Management Areas ("DWMA") that needed to be established as desert tortoise reserves and should be protected from known threats. The project area fell into areas proposed as DWMAs by the FWS.[7] Unfortunately, the BLM has to date failed to adequately protect the area. The on-the-ground habitat has not changed for the desert tortoise on the project site, substantiated by the relative density of the animals on the project site and the DEIS misses the opportunity to re-evaluate the site for its importance and potential contributions to desert tortoise recovery efforts. 0044-16 0044-17

The baseline inventories and discussions in the DEIS are similarly inadequate for other species including birds, lizards, and late-summer and fall blooming plants. Indeed, the fact that there are significant late-summer and fall rains, pertinent to rare plant visibility and well as Gila monster activity, is almost completely absent from the document. 0044-18

As discussed below, because of the deficiencies of the baseline data for the proposed project area, the DEIS fails to adequately describe the environmental baseline. Many of the rare and common but essential species and habitats have incomplete and/or vague on-site descriptions that make determining the proposed project's impacts difficult at best. Some of the rare species/habitats baseline conditions are totally absent, therefore no impact assessment is provided either. A supplemental document is required to fully identify the baseline conditions of the site, and that baseline needs to be used to evaluate the impacts of the proposed project.

[5] DEIS, page 3-35.
[6] DEIS, page 3.34.
[7] U.S. Fish and Wildlife Service. 1994. Desert Tortoise Recovery Plan. Desert tortoise (Mojave population) Recovery Plan. U.S. Fish and Wildlife Service, Portland, Oregon. Pgs. 73+appendices. See Figure 9. http://ecos.fws.gov/docs/recovery_plans/1994/940628.pdf .

0044-15
Biological Resources
Your statement is included in the public record and will be taken into account by decision-makers when they consider the proposed project.

0044-16
Biological Resources
Your statement is included in the public record and will be taken into account by decision-makers when they consider the proposed project.

0044-17
Biological Resources
The issue raised by this comment is outside of the scope of the EIS.

0044-18
Biological Resources
For the analysis contained within the FEIS, presence was assumed for the special status wildlife species and plant species that were not targeted by species specific surveys. For all of these special status species the FEIS contains the appropriate Applicant Proposed Measures and Mitigation Measures to mitigate and minimize the potential adverse impacts to these special status species that would result from the construction, operation and maintenance, and decommission of the Proposed Project.

The Clokey buckwheat was the only special status plant identified as having the potential to occur within the Proposed Project which would bloom outside of the spring botanical inventory: The text in the FEIS within Chapter 3 under special status species section that addresses this issue is:

The Clokey buckwheat was not observed within the Proposed Project area during the 2010 botanical inventory (Sycamore Environmental Consultants, Inc 2010). Even though the botanical inventory was conducted outside of the flowering season for this species, the Clokey buckwheat is a perennial species and would have been observed if it was present within the Proposed Project (Sycamore Environmental Consultants, Inc 2010).

4. The DEIS Fails to Adequately Identify and Analyze Direct and Indirect Impacts to Biological Resources.

The DEIS fails to adequately analyze the direct, indirect, and cumulative impacts of the proposed project on the environment. The Ninth Circuit has made clear that NEPA requires agencies to take a "hard look" at the effects of proposed actions; a cursory review of environmental impacts will not stand. *Idaho Sporting Congress v. Thomas*, 137 F.3d 1146, 1150-52, 1154 (9th Cir. 1998). Where the BLM has incomplete or insufficient information, NEPA requires the agency to do the necessary work to obtain it where possible. 40 C.F.R. §1502.22; *see National Parks & Conservation Ass'n v. Babbitt,* 241 F.3d 722, 733 (9 th Cir. 2001) ("lack of knowledge does not excuse the preparation of an EIS; rather it requires [the agency] to do the necessary work to obtain it.") 0044-19

Moreover, BLM must look at reasonable mitigation measures to avoid impacts identified in the DEIS but failed to do so here. Even in those cases where the extent of impacts may be somewhat uncertain due to the complexity of the issues, BLM is not relieved of its responsibility under NEPA to discuss mitigation of reasonably likely impacts at the outset. Even if the discussion may of necessity be tentative or contingent, NEPA requires that the BLM provide some information regarding whether significant impacts could be avoided. *South Fork Band Council of Western Shoshone v. DOI* , 588 F.3d 718 , 727 (9th Cir. 2009).

Desert Tortoise

The desert tortoise has lived in the western deserts for tens of thousands of years. In the 1970's their populations were noted to decline. Subsequently, as mentioned above, the species was listed as threatened by the U.S. Fish and Wildlife Service in 1990, which then issued a Recovery Plan for the tortoise in 1994. The U.S. Fish and Wildlife Service is in the process of updating the Recovery Plan, and a Draft Updated Recovery Plan was issued in 2008, however it has not been finalized. Current data indicate a continued decline across the range of the listed species[8] despite its protected status and recovery actions.

The original and draft Updated Recovery Plans both recognize the uniqueness of the northern Ivanpah Valley population in California and Nevada. This particular subpopulation of tortoise is part of the Northeastern Recovery unit. The Recovery Plan recognizes that the Northeastern Recovery Unit has "three mtDNA haplotypes are found in this recovery unit, but they exhibit low allozyme variability with relatively little local differentiation"[9] indicating that the tortoises 0044-20

[8] Doak, D., P. Kareiva and B. Klepetka 1994. Modeling population viability for the desert tortoise in the western Mojave desert. Ecological Applications 4(3): 446-460; and,
USFWS. 2009. Scientific Advisory Committee (SAC), Desert Tortoise Recovery Office. Meeting Summary, March 13, 2009, San Diego Wild Animal Park, Escondido, CA. pgs 4.
http://www.fws.gov/Nevada/desert_tortoise/documents/sac/20090313_SAC_meeting_summary.pdf ;and,
USFWS, 2009. Range-wide Monitoring of the Mojave Population of the Desert Tortoise: 2007 Annual Report. Report by the Desert Tortoise Recovery Office, U.S. Fish and Wildlife Service, Reno, Nevada. Pgs. 77.

[9] USFWS. 1994. Desert Tortoise Recovery Plan. Desert tortoise (Mojave population) Recovery Plan. U.S. Fish and Wildlife Service, Portland, Oregon. Pgs. 73+appendices. Page 21.
http://ecos.fws.gov/docs/recovery_plans/1994/940628.pdf .

0044-19
Biology - Desert Tortoise
For the analysis contained within the FEIS, presence was assumed for the special status wildlife species and plant species that were not target by specific surveys. For all of these special status species the FEIS contains the appropriate Applicant Proposed Measures and Mitigation Measures to mitigate and minimize the potential adverse impacts to these special status species as result of the construction, operation and maintenance, and decommission of the Proposed Project.

The Clokey buckwheat was the only special status plant identified as having the potential to occur within the Proposed Project which would bloom outside of the spring botanical inventory: The text in the FEIS within Chapter 3 under special status species section that addresses this issue is:

The Clokey buckwheat was not observed within the Proposed Project area during the 2010 botanical inventory (Sycamore Environmental Consultants, Inc 2010). Even though the botanical inventory was conducted outside of the flowering season for this species, the Clokey buckwheat is a perennial species and would have been observed if it was present within the Proposed Project (Sycamore Environmental Consultants, Inc 2010).

0044-20
Biology - Desert Tortoise
The final relocation/translocation plan will be outlined in the Biological Opinion that will be issued by USFWS. This plan will follow USFWS's May 2010 Translocation of Desert tortoises (Mojave Population) from Project Sites: Plan Development Guidance and will address the following issues: selection of the translocation site; selection of a control site (if five or more tortoises are to be translocated); determination of the health of tortoises (translocatees and residents); methods to be used during the translocation process; and post-translocation monitoring (minimum 5-years) of the translocated individuals. Only healthy tortoises, as determined by the results of a health assessment of each tortoise, will be translocated. Additionally, the translocation site will be located within the same habitat type and consists of a desert tortoise population of similar size and structure (genetic included) as the Project Site. To determine the success of the translocation of the tortoises, a control site of similar size, habitat, and desert tortoise population to that of the relocation site will be monitored and compared to.

within this Recovery Unit are genetically distinct from other Recovery Unit populations. Recent population genetics studies[10] have further confirmed that the desert tortoise population in the Ivanpah Valley on and adjacent to the project site are distinctly genetically different from tortoises elsewhere within the Northeastern Recovery Unit, and very genetically different from tortoises in other adjacent Recovery Units. This finding adds weight to the idea that a conservative approach needs to be applied to management of the desert tortoise in the Ivanpah Valley. The DEIS fails to identify and consider the localized impact to this genetically rare portion of the population on the project site.

0044-20 Continued

Moreover, as discussed in detail later in this document, the BLM and proponent propose to translocate existing on-site desert tortoises, but fail to provide any details of the translocation, instead deferring to a future plan, the impacts from which cannot be assessed by the public or the decision-makers.[11] Thus, the DEIS is not sufficiently thought through and fails to consider all of the likely impacts to the tortoise that are proposed to be moved as well as the host tortoises, or how future projects in the area may also affect these same animals and the population in the area, even though the DEIS notes that, "Impacts would be extensive, as well, because the translocated individuals would most likely impact the fitness of the desert tortoises that occupy the translocation site, and the operation of the Proposed Project would remove 2,966.8 acres of suitable desert tortoise habitat from the Ivanpah Valley."[12].

0044-21

NEPA mandates consideration of the relevant environmental factors and environmental review of "[b]oth *short- and long-term* effects" in order to determine the significance of the project's impacts. 40 C.F.R. § 1508.27(a) (emphasis added). BLM has clearly failed to do so in this instance with respect to the impact to the tortoise. On this basis as well, BLM must prepare a revised or supplemental DEIS and circulate it for public review and comment.

Rare and Special Status Plants

Several rare plants were identified as having potential to occur on the proposed project site; these were enumerated in Table 3.6-1 of the DEIS, and in section 3.6.3.1. Several of the species are BLM Sensitive Species, including the white bearpoppy, Spring Mountains milk-vetch, and white-margined, yellow two-toned and rosy two-toned penstemons.

Management of special status species (and indeed all rare species) on BLM lands should focus on ensuring long term survival and recovery in order to prevent the need for future listings. Nothing in the DEIS shows that the BLM took into consideration these critical management concerns. *See* BLM Manual 6840.2.C (Implementation) ("BLM shall manage Bureau sensitive species and their habitats to minimize or eliminate threats affecting the status of the species or to improve the condition of the species habitat, by . . . [e]nsuring that BLM activities affecting Bureau sensitive species are carried out in a way that is consistent with its objectives for managing those species and their habitats at the appropriate spatial scale . . . [and] [c]onsidering

[10] Murphy R.W., K.H. Berry, T. Edwards and A.M. McLuckie. 2007. A Genetic Assessment of the Recovery Units for the Mojave Population of the Desert Tortoise, *Gopherus agassizii*. Chelonian Conservation and Biology, 2007, 6(2): 229–251.
[11] See DEIS pages ES-7 and B-4.
[12] DEIS, pages 4-46-47.

0044-20 cont'd
Biology - Desert Tortoise
The final relocation/translocation plan will be outlined in the Biological Opinion that will be issued by USFWS. This plan will follow USFWS's May 2010 Translocation of Desert tortoises (Mojave Population) from Project Sites: Plan Development Guidance and will address the following issues: selection of the translocation site; selection of a control site (if five or more tortoises are to be translocated); determination of the health of tortoises (translocatees and residents); methods to be used during the translocation process; and post-translocation monitoring (minimum 5-years) of the translocated individuals. Only healthy tortoises, as determined by the results of a health assessment of each tortoise, will be translocated. Additionally, the translocation site will be located within the same habitat type and consists of a desert tortoise population of similar size and structure (genetic included) as the Project Site. To determine the success of the translocation of the tortoises, a control site of similar size, habitat, and desert tortoise population to that of the relocation site will be monitored and compared to.

0044-21
Biology - Desert Tortoise
The final relocation/translocation plan will be outlined in the Biological Opinion that will be issued by USFWS. This plan will follow USFWS's May 2010 Translocation of Desert tortoises (Mojave Population) from Project Sites: Plan Development Guidance and will address the following issues: selection of the translocation site; selection of a control site (if five or more tortoises are to be translocated); determination of the health of tortoises (translocatees and residents); methods to be used during the translocation process; and post-translocation monitoring (minimum 5-years) of the translocated individuals. Only healthy tortoises, as determined by the results of a health assessment of each tortoise, will be translocated. Additionally, the translocation site will be located within the same habitat type and consists of a desert tortoise population of similar size and structure (genetic included) as the Project Site. To determine the success of the translocation of the tortoises, a control site of similar size, habitat, and desert tortoise population to that of the relocation site will be monitored and compared to.

ecosystem management and the conservation of native biodiversity to reduce the likelihood that any native species will require Bureau sensitive species status").

The Eastern Mojave Desert is a botanical frontier where in the past few years alone, a number of very significant botanical finds have occurred and more are to be expected. For example, at least five species previously undocumented within the California Desert Conservation Area boundaries have been documented in the last few years near the project site in Nevada. Additionally, these species that are found on the "edges" of their range are incredibly important for species persistence[13] especially in light of global climate change.[14]

As noted in the DEIS, to date no protocol level botanical surveys have been conducted in the project area, and although formal botanical surveys are planned for the spring of 2010, their results have not been used to inform the disclosure and analysis in the DEIS.[15] 0044-22

A related failure of the DEIS is the lack of late summer/early fall-flowering plant surveys on the proposed project site. Approximately 40% of the plant taxa in Ivanpah Valley flower in late summer/early fall due to its location and bimodal precipitation regime. The spring surveys would fail to detect and document most of these summer/early fall-flowering rare plants on site. 0044-23

Additionally because of the vagaries of precipitation in the Mojave Desert, surveys should be performed over a number of years during both the spring and summer/fall flowering seasons in order to maximize the probability of identifying all special status species that occur on the project site. Projects of this size and potential impact typically include more than two years of surveys. Without an accurate inventory of plant taxa that occur on site, it is not possible to fully assess project impacts to special status plants and therefore meaningful mitigation cannot be developed. 0044-24

Because of the lack of comprehensive surveys, the DEIS failed to adequately analyze the impacts that the proposed project would have on rare and special status plant species including direct, indirect and cumulative impacts to these plants and failed to adequately identify and evaluate potential alternatives that would avoid or minimize the impacts of the project on these species. In order to comply with NEPA, the BLM should revise or supplement the DEIS with this critical information and circulate it for public review and comment.

Special Status Birds

As with native plants, there are no bird surveys documented in the DEIS, nor are any described as being planned. Without such inventories, it is impossible for the DEIS to describe the impacts to the species or to develop minimization and mitigation procedures.

[13] Leppig, G. and J.W. White. 2006. Conservation of peripheral plant populations in California. Madrono 53(3):64-274.

[14] Kelly, A. E. and M.L. Goulden 2008. Rapid shifts in plant distribution with recent climate change. *Proc Natl Acad Sci USA* 105:11823–11826.

[15] DEIS, page 4-40.

0044-22
Biological Resources
The results of the 2010 botanical inventory have been incorporated into the FEIS.

0044-23
Biology - Plants
The Clokey buckwheat was the only special status plant identified as having the potential to occur within the Proposed Project which would bloom outside of the spring botanical inventory: The text in the FEIS within Chapter 3 under special status species section that addresses this issue is:

The Clokey buckwheat was not observed within the Proposed Project area during the 2010 botanical inventory (Sycamore Environmental Consultants, Inc 2010). Even though the botanical inventory was conducted outside of the flowering season for this species, the Clokey buckwheat is a perennial species and would have been observed if it was present within the Proposed Project (Sycamore Environmental Consultants, Inc 2010).

0044-24
Biology - Plants
The results of the botanical inventory combined with a review of the historical occurrences of the special status plant were determined to be sufficient in assessing the potential direct and indirect impacts to special status plant species resulting from the construction, operation and maintenance, and decommission of the Proposed Project.

Several special status species were identified as having potential to occur on the proposed project site; these were enumerated in Table 3.6-1 of the DEIS, and in section 3.6.3.4. Several of the species are BLM Sensitive Species in Nevada, including the golden eagle, burrowing owl, LeConte's thrasher, peregrine falcon, prairie falcon, phainopepla, and loggerhead shrike.

Management of special status species (and indeed all rare species) on BLM lands should focus on ensuring long term survival and recovery in order to prevent the need for future listings. Nothing in the DEIS shows that the BLM took into consideration these critical management concerns. *See* BLM Manual 6840.2.C (Implementation) ("BLM shall manage Bureau sensitive species and their habitats to minimize or eliminate threats affecting the status of the species or to improve the condition of the species habitat, by . . . [e]nsuring that BLM activities affecting Bureau sensitive species are carried out in a way that is consistent with its objectives for managing those species and their habitats at the appropriate spatial scale . . . [and] [c]onsidering ecosystem management and the conservation of native biodiversity to reduce the likelihood that any native species will require Bureau sensitive species status").

The DEIS notes that golden eagles are potentially nesting in the Clark, McCullough and Highland Mountain ranges and foraging in the lower elevation areas such as the project site.[16] The DEIS fails to present exactly how it will mitigate the loss of a substantial amount of foraging habitat for the golden eagle, either as a result of this project, or cumulatively as a result of the other solar projects planned in the Ivanpah Valley and vicinity. The fact still remains that significant amounts of foraging habitat will decrease carrying capacity of the landscape and could result in a potential loss of habitat needed to support a nesting pair, which would impact reproductive capacity. 0044-25 0044-26

The DEIS fails to disclose the number of pairs of golden eagles that could be affected by the proposed project. Scientific literature on this subject is clear - the presence of humans detected by a raptor in its nesting or hunting habitat can be a significant habitat-altering disturbance even if the human is far from an active nest[17]. Regardless of distance, a straight line view of disturbance affects raptors, and an effective approach to mitigate impacts of disturbance for golden eagles involves calculation of view sheds using a three-dimensional GIS tool and development of buffers based on the modeling[18]. The DEIS fails to discuss the potential impacts on nesting golden eagles in the Clark Mountains which is part of the Mojave National Preserve. Golden eagles use only a small subset of their home territories during nesting for foraging. These essential areas may include the proposed project site, however the DEIS does not analyze this important factor of nesting success. 0044-27 0044-28

Because of the lack of comprehensive surveys, the DEIS failed to adequately analyze the impacts that the proposed project would have on BLM sensitive bird species including direct, indirect

[16] DEIS, page 3-43.
[17] Richardson and Miller. 1997. Recommendations for protecting raptors from human disturbance: a review. Wildlife Society Bulletin 25(3): 634-638.
[18] Camp, R.J., D.T. Sinton and R.L. Knight 1997. Viewsheds: a Complementary Management Approach to Buffer Zones. Wildlife Society Bulletin 25(3): 612-615; and Richardson and Miller. 1997. Richardson and Miller 1997

0044-25
Biological Resources
Though the Proposed Project would result in the loss of some foraging habitat for the golden eagle, the proportion of foraging habitat that would be lost due to the Proposed Project is small compared to the total amount of available foraging habitat within the Ivanpah Valley. Additionally, the golden eagle would still be able to access the habitat within the perimeter fence of the Proposed Project, so that the actual potential loss of foraging habitat is less than the total footprint of the Proposed Project. There was no mitigation developed to address the loss of potential foraging habitat, rather mitigation was developed that would reduce the potential impacts to golden eagles from project related transmissions lines and nesting golden eagles.

0044-26
Biological Resources
Thank you for your comment. Though the Proposed Project would result in the loss of some foraging habitat for the golden eagle, the proportion of foraging habitat that would be lost due to the Proposed Project is small compared to the total amount of available foraging habitat within the Ivanpah Valley. Additionally, the golden eagle would still be able to access the habitat within the perimeter fence of the Proposed Project, so that the actual potential loss of foraging habitat is less than the total footprint of the Proposed Project.

0044-27
Biological Resources
The ananlysis of the potential impacts to nesting golden eagles within the surrounding mountain ranges has been updated in the FEIS. The project is not anticipated to have an adverse impact on nesting eagles within the Clark Mountain Range. The Proposed Project is greater than 10 miles away from any portion of the Clark Mountain Range that is classified as part of the Mojave Wilderness Area. Additionally, the City of Primm and Interstate 15 are located in between the Proposed Project and the closest portion of the Clark Mountain Range.

0044-28
Biological Resources
Your statement is included in the public record and will be taken into account by decision-makers when they consider the proposed project.

and cumulative impacts to these birds and failed to adequately identify and evaluate potential alternatives that would avoid or minimize the impacts of the project on these species. Because environmental review does not adequately identify or analyze impacts to special status birds from the proposed project although the proposed project could have significant impacts to birds, including migratory birds and golden eagles, it is impossible for the BLM to ensure that the project is consistent with the Migratory Bird Treaty Act (16 U.S.C. § 701 *et seq.*) or the Bald and Golden Eagle Protection Act (16 U.S.C. § 668 et seq.), both of which prohibit take. 0044-29

Gila Monster and Chuckwalla

Both Gila monsters and chuckwallas are BLM Sensitive Species in Nevada and the same management direction from BLM Manual 6840.2 applies as previously described. The DEIS makes no mention of formal surveys to detect the presence or levels of use by Gila monsters on the project site, although it does note they are probable in the proximity of the project site.[19] 0044-30

Mitigation measure "Bio-09" for Gila monsters and chuckwallas proposes capture and relocation as the mitigation strategy if the lizard is encountered.[20] Relocation of banded Gila monster has been shown to be an ineffective strategy[21]. Similar to desert tortoises, the Gila monsters try to return to their original sites despite relocation distances. Effective mitigation for these species needs to include strategies that will minimize mortality. 0044-31

Because of the lack of comprehensive surveys, the DEIS failed to adequately analyze the impacts that the proposed project would have on Gila monsters and chuckwallas including direct, indirect and cumulative impacts to these species and failed to adequately identify and evaluate potential alternatives that would avoid or minimize the impacts of the project on these species.

American Badger

American badgers are designated as a BLM Sensitive Species in Nevada and the same management direction from BLM Manual 6840.2 applies as previously described. The DEIS notes that no formal surveys to detect the presence or levels of use by badgers on the project site although surveys are planned for the spring of 2010.[22] The DEIS notes that badgers are likely to occur within the project site.[23]

Literature on the highly territorial badger indicates that badger home territories range from 340 to 1,230 hectares[24]. Therefore, the proposed project could displace at least one badger territory. While surveys prior to construction are clearly essential since badgers have been located on the 0044-32

[19] DEIS, page 3.37.
[20] DEIS, page 4-59.
[21] Sullivan, B.K., M.A. Kwiatkowski, G.W. Schuett 2004. Translocation of Urban Gila Monsters: a Problematic Conservation Tool. Biological Conservation 117L 235-242.
[22] DEIS, page 4-47.
[23] DEIS, page 3-41.
[24] Long, C.A. 1973. Taxidea taxus. Mammalian Species 26: 1-4; and Goodrich, J.M. and S.W. Buskirk 1998. Spacing and Ecology of North American Badgers (*Taxidea taxus*) in a Prairie-dog (*Cynomys leucurus*) Complex. Journal of Mammology 79(1): 171-179.

0044-29
Biological Resources
To ensure compliance with MBTA, the FEIS contains specific Mitigation Measures; MM BIO-1: Preconstruction Surveys, MM BIO-3: Biological Monitors MM BIO-5: Migratory Birds and Raptors Impacts Reduction Measures and MM BIO-6: Avian Protection Plan that specifically address potential impacts to bird species protected by MBTA. The details of these Mitigation Measures are contained within section 4.6.9 Mitigation Measures – Biological Resources of the FEIS.

0044-30
Biological Resources
For the analysis of the Gila monster and the chuckwalla there were no specific surveys conducted for either of these species, rather it was assumed that these species would be present and were assessed and mitigated as if present. To mitigate the potential adverse impacts to either of these species as a result of the construction, operation and maintenance, and decommission of the Proposed Project, the following Mitigation Measures were developed; BIO-1: Preconstruction Surveys, MM BIO-3: Biological Monitors MM BIO-5, MM BIO-4: Worker Environmental Awareness Program, MM BIO-9: Gila Monster and Chuckwalla Measures, and MM BIO-11: Cover Steep-Walled Trenches or Excavations during Construction. The details of these Mitigation Measures are contained within section 4.6.9 Mitigation Measures – Biological Resources of the FEIS.

0044-31
Biological Resources
The Mitigation Measure BIO-09 Gila Monster and Chuckwalla Measures follows the requirements of the current NDOW construction site protocols for the Gila monster.

0044-32
Biological Resources
There have not been any formal surveys that have confrimed the presence of badgers within the Proposed Project area. Rather the assumption has been made that Proposed Project area containes suitable habitat and badgers are present. Mitigation measures have been established to mitigate any negative impacts to badgers that occur within the Proposed Project area through the relocation of individuals.

site, relocation of badgers into suitable habitat may result in "take". Relocation is likely to move relocated badgers into existing badger's territory. Studies need to be provided on both on- and off-site badger territories if animals are to be relocated in order to increase chances of persistence. At a minimum, the EIS should identify suitable habitat. 0044-33

Because of the lack of comprehensive surveys, the DEIS failed to adequately analyze the impacts that the proposed project would have on badgers including direct, indirect and cumulative impacts and failed to adequately identify and evaluate potential alternatives that would avoid or minimize the impacts of the project on this species.

Vegetation

The proposed project envisions that where clearing and grubbing are not required for the construction and maintenance of permanent structures, that native vegetation would be left and mowed to a height of less than 12 inches. The DEIS readily recognizes that this regimen of constant mowing will substantially weaken, if not kill the native vegetation leading to a species shift favoring those plants that are adapted to or can tolerate the new circumstances, quite likely invasive weed species.[25]

The DEIS fails to analyze the long term consequences of this shift in vegetation in terms of native species, ground cover and soil erosivity. Instead it relies on references to non-specific future plans such as Erosion Control and Noxious Weed Control Plans.[26]

Without knowing what the specifics are of these plans, how can the DEIS analyze and disclose the true indirect, direct and cumulative impacts of the proposed project? For instance, assuming herbicides would be a primary tool in combating invasive weeds, what are the impacts of repeated applications of these chemicals on the plants, animals and surface and ground waters both on and off-site? 0044-34

The DEIS has failed to adequately describe the direct, indirect and cumulative impacts associated with the planned vegetation management on the site.

Cryptobiotic soil crusts

Cryptobiotic soil crusts are an essential ecological component in arid lands. They are the "glue" that holds surface soil particles together precluding erosion, provide "safe sites" for seed germination, trap and slowly release soil moisture, and provide CO_2 uptake through photosynthesis[27]. The DEIS states that the project area in Clark County is considered

[25] DEIS, page 4-37.
[26] DEIS, page 4-39.
[27] Belnap, J., S. L. Phillips, J. E. Herrick, J. R. Johansen. 2007. Wind erodibility of soils at Fort Irwin, California (Mojave Desert), USA, before and after trampling disturbance: Implications for land management. Earth Surface Processes and Landforms 32(1):75-84.
Belnap, J. 2006. The potential roles of biological soil crusts in dryland hydrologic cycles. Hydrological Processes 20: 3159-3178.

0044-33
Biological Resources
There are no proposed badger surveys proposed for the Propose Project, rather the assumption has been made that the Proposed Project area contains suitable habitat and badgers are present. To mitgate potential impacts to badgers, a badger specific mitigation measure has been developed. Text has been added to mitigation measure to require the relocated individual(s) are relocated to suitable badger habitat.

0044-34
Biology - Plants
Section 4.6.2 Direct and Indirect Effects by Alternative - Vegetation
The FEIS has incorporated the results of the April 2010 Botanical Inventory that surveyed the Prposed Project area for rare plants. The botanical inventory observed the Death Valley ephedra and the FEIS assessed the impacts to this species. The herbicide that would be used by the Applicant will be identfiied in the Noxious Weed Plan and will have to be approved by BLM prior to the use. The FEIS has been revised to assess the potential impacts of herbicide application.

"attainment/unclassifiable area" for PM10 emissions. DEIS at 3-5, Table 3.1-3. However, the Mojave Desert Air Quality Management District in California has found that this same area is already in non-attainment for PM-10 particulate. The construction of the proposed project would further increase emissions of these types of particles because of the disruption and elimination of potentially thousands of acres of cryptobiotic soil crusts. 0044-35

The DEIS does not describe the on-site cryptobiotic soil crusts. The proposed project will disturb an unidentified portion of these soil crusts and cause them to lose their capacity to stabilize soils and trap soil moisture. The DEIS fails to provide a map of the soil crusts over the project site, and to present any avoidance or minimization measures. It is unclear how many acres of cryptobiotics soils will be affected by the project. A supplemental DEIS must be prepared which identifies the extent of the cryptobiotic soils on site and analyze the potential impacts to these diminutive, but essential desert ecosystem components as a result of this project. 0044-36

5. *Closure, Restoration and Rehabilitation*

Desert lands are notoriously hard to revegetate or rehabilitate[28] and revegetation never supports the same diversity that originally occurred in the plant community prior to disturbance[29]. The task of revegetating over 4.6 square miles will be a Herculean effort that will require significant financial resources. In order to assure that the ambitious goals of the revegetation effort is met post project closure, it will be necessary to bond the project, so that all revegetation obligations will met and assured. The bond needs to be structured so that it is tied to meeting the specific revegetation criteria. The DEIS makes no mention of such assurances. 0044-37

Similar to the previous comments for "Vegetation", the DEIS avoids any specificity regarding rehabilitation and restoration upon closure, instead deferring to non-specific Site Rehabilitation Plan, Facility Decommissioning Plan and Restoration Plan.[30]

The restoration/rehabilitation plans must contain a seed list that captures the original diversity of both perennial and annual species. Enabling an accelerated successional process is appropriate and desirable, however, the plan should not rely on dispersal of late successional propagules over the six square mile area, but should instead include sequential seeding, where later successional species are introduced by seed after early successional species establishment. This strategy would encourage quicker re-establishment of late successional species throughout the site. 0044-38

Belnap J. 2003. The world at your feet: Desert biological soil crusts. Frontiers in Ecology and the Environment 1(5):181-189.
Belnap J., S. L. Phillips, M. Duniway, R. Reynolds. 2003. Soil fertility in deserts: A review on the influence of biological soil crusts and the effect of soil surface disturbance on nutrient inputs and losses. In: A. S. Alsharhan, W. W. Wood, A. Goudie, A. R. Fowler, and E. M. Abdellatif, editors. Desertification in the Third Millennium: Lisse, The Netherlands, Swets & Zeitlinger (Balkema), pp.245-252.
[28] Lovich, J. E. and D. Bainbridge. 1999. Anthropogenic Degradation of the Southern California Desert Ecosystem and Prospects for Natural Recovery and Restoration. Environmental Management 24(3): 309-326.
[29] Longcore, T., R. Mattoni, G. Pratt and C. Rich. 1997. On the Perils of Ecological Restoration: Lessons from the El Segundo Blue Butterfly. In 2nd Interface between Ecology and Land Development in California. J. Keely eds.
[30] For example, see DEIS, page 4-39.

0044-35
Soils
References to the project area being attainment/unclassifiable for PM10 have been revised throughout the document.

0044-36
Soils
Section 3.4.4 has been added to address cryptobiotic soils.

0044-37
General
Your statement is included in the public record and will be taken into account by decision-makers when they consider the proposed project.

0044-38
Mitigation
Thank you for your comment, the restoration/rehabilitation plan will need the apporval of BLM and will be required to follow the current BLM guidleines for habitat restoration and monitoring of habitat restoration.

Native annual species must be a component of revegetation, because native wildlife rely heavily on spring and fall annuals for survival[31].

Revegetation criteria are essential as a method for assessing success of revegetation efforts, and need to be included in these plans.

6. *Failure to Identify Appropriate Mitigation*

Because the DEIS fails to provide adequate identification and analysis of impacts, inevitably, it also fails to identify adequate mitigation measures for the project's environmental impacts. "Implicit in NEPA's demand that an agency prepare a detailed statement on 'any adverse environmental effects which cannot be avoided should the proposal be implemented,' 42 U.S.C. § 4332(C)(ii), is an understanding that an EIS will discuss the extent to which adverse effects can be avoided." *Methow Valley*, 490 U.S. at 351-52. Because the DEIS does not adequately assess the project's direct, indirect, and cumulative impacts, its analysis of mitigation measures for those impacts is necessarily flawed. The DEIS must discuss mitigation in sufficient detail to ensure that environmental consequences have been fairly evaluated." *Methow Valley*, 490 U.S. at 352; *see also Idaho Sporting Congress*, 137 F.3d at 1151 ("[w]ithout analytical detail to support the proposed mitigation measures, we are not persuaded that they amount to anything more than a 'mere listing' of good management practices"). As the Supreme Court clarified in *Robertson*, 490 U.S. at 352, the "requirement that an EIS contain a detailed discussion of possible mitigation measures flows both from the language of [NEPA] and, more expressly, from CEQ's implementing regulations" and the "omission of a reasonably complete discussion of possible mitigation measures would undermine the 'action forcing' function of NEPA."

Although NEPA does not require that the harms identified actually be mitigated, NEPA does require that an EIS discuss mitigation measures, with "sufficient detail to ensure that environmental consequences have been fairly evaluated" and the purpose of the mitigation discussion is to evaluate whether anticipated environmental impacts *can be avoided. Methow Valley*, 490 U.S. at 351-52. As the Ninth Circuit recently noted: "[a] mitigation discussion without at least *some* evaluation of effectiveness is useless in making that determination." *South Fork Band Council of Western Shoshone v. DOI* , 588 F.3d 718 , 727 (9th Cir. 2009) (emphasis in original).

Here, the DEIS mostly relies on the preparation of future plans, with no specificity provided as to what the plans will do, and does not provide a full analysis of possible mitigation measures to avoid or lessen the impacts of the proposed project and therefore the BLM cannot properly assess the likelihood that such measures would actually avoid the impacts of the proposed project. 0044-39

A supplemental DEIS must be prepared to provide the lacking specificity and details so that a meaningful evaluation of the proposal and its impacts can be achieved.

[31] Jennings, W.B. 2002. Diet Selection by the Desert Tortoise in Relation to the Flowering Phenology of Ephemeral Plants. Chelonian Conservation and Biology 4(2): 353-358; and,
Shoemaker, V.H., K.A. Nagy and W.R. Costa 1976. Energy Utilization and Temperature Regulation in Jackrabbitss (Lepus californicus) in the Mojave Desert. Physiological Ecology 49(3): 364-375.

0044-39
Mitigation
The FEIS will incorporate the final approved mitigation measures and will also include the final plans in regards to restoration and protection plans. The mitigation measures and restoration and protection plans will need to be approved by BLM before the finalizing of the FEIS.

7. *Cumulative Impacts and Growth Inducing Impacts.*

While cumulative impacts and growth inducing impacts are related they must be independently analyzed. Moreover, in order to fairly assess the growth inducing impacts of a project the project description must be accurate and adequate, because an inadequate project description (as here) risks grossly understating the growth inducing impacts of the project.

Cumulative Impacts

A cumulative impact is "the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time." 40 C.F.R. § 1508.7. The Ninth Circuit requires federal agencies to "catalogue" and provide useful analysis of past, present, and future projects. *City of Carmel-By-The-Sea v. U.S. Dept. of Transp.*, 123 F.3d 1142, 1160 (9th Cir. 1997); *Muckleshoot Indian Tribe v. U.S. Forest Service*, 177 F.3d 800, 809-810 (9th Cir. 1999).

"In determining whether a proposed action will significantly impact the human environment, the agency must consider '[w]hether the action is related to other actions with individually insignificant but cumulatively significant impacts. Significance exists if it is reasonable to anticipate a cumulatively significant impact on the environment.' 40 C.F.R. § 1508.27(b)(7)." *Oregon Natural Resources Council v. BLM*, 470 F.3d 818, 822-823 (9th Cir. 2006). NEPA requires that cumulative impacts analysis provide "some quantified or detailed information," because "[w]ithout such information, neither courts nor the public . . . can be assured that the Forest Service provided the hard look that it is required to provide." *Neighbors of Cuddy Mountain v. United States Forest Service*, 137 F.3d 1372, 1379 (9th Cir. 1988); *see also id.* ("very general" cumulative impacts information was not hard look required by NEPA). The discussion of future foreseeable actions requires more than a list of the number of acres affected, which is a necessary but not sufficient component of a NEPA analysis; the agency must also consider the actual environmental effects that can be expected from the projects on those acres. *See Klamath-Siskiyou Wildlands Ctr. v. BLM*, 387 F.3d 989, 995-96 (9th Cir. 2004) (finding that the environmental review documents "do not sufficiently identify or discuss the incremental impact that can be expected from each [project], or how those individual impacts might combine or synergistically interact with each other to affect the environment. As a result, they do not satisfy the requirements of the NEPA.") Finally, cumulative analysis must be done as early in the environmental review process as possible, it is not appropriate to "defer consideration of cumulative impacts to a future date. 'NEPA requires consideration of the potential impacts of an action *before* the action takes place.'" *Neighbors*, 137 F.3d at 1380 *quoting City of Tenakee Springs v. Clough*, 915 F.2d 1308, 1313 (9th Cir. 1990) (emphasis in original).

The Cumulative Scenario in the DEIS[32] fails to adequately identify and analyze the scope of the cumulative impacts to various resources across appropriate scales for each impact. While the

[32] DEIS, page 3-112-124.

DEIS looks at the Ivanpah Valley to some extent, it ignores other scales of analysis. For example, the DEIS should have considered the cumulative impacts to the desert tortoise and its recovery at several different scales—for the Northeastern Mojave Desert Tortoise Recovery Unit in the North Ivanpah Valley within California and Nevada, the Recovery Unit as a whole, the species within Nevada, and/or the species as a whole. Each of these scales of analysis would likely reveal different information about the cumulative impacts of this project. 0044-40

This population of the Northeastern Mojave Desert Tortoise Recovery Unit in the North Ivanpah Valley is unique and is at risk from the cumulative effects of this project, the ISEGS, the Optisolar (now First Solar) power project, the proposed DesertXpress High Speed Passenger Train, the California High-Speed Rail Project ("Magvev"), the EITP upgrade of transmission line and substations in California and Nevada, and the Southern Nevada Supplemental Airport project. In evaluating these cumulative impacts of desert tortoise, the DEIS does provide information on the analyze the acres of desert tortoise habitat impacted and the proportionate share caused by the project, but it fails to describe the impact in any meaningful context such as percent of tortoise habitat in the Ivanpah Valley impacted, or the percent of habitat impacted for this specific genetic strain of tortoise. More importantly, it fails to answer the "so what?" question of the impacts of these cumulative projects on the recovery and survival of desert tortoise in the Northeastern Mojave Desert Tortoise Recovery Unit. 0044-41

An example of the frivolous and incomplete cumulative impacts analysis done for desert tortoise can be summed up by the incredulous statement, "One potential effect from future projects, including the Proposed Action, could be habitat loss over a large area." [33] *"Potential"? "Could be"?* The DEIS fails miserably in fulfilling its obligations under the NEPA in this analysis. 0044-42

The cumulative impact analysis for vegetation is similarly flawed in that acres impacted are merely tabulated without any analysis of what these impacts mean to the biological resources of the analysis area, outside of generic statements such as, "Given the scale and number of projects proposed within the Ivanpah Valley region, these impacts could be significant on a regional scale", and "would result in substantial permanent conversion of desert habitat to industrial/commercial uses. This could have significant effects on a variety of species through direct habitat loss and/or habitat fragmentation."[34] 0044-43

With regards to other wildlife and special status species, the DEIS provides absolutely no analysis. Instead, it states, "Data is not available at this time to analyze the cumulative impacts of all projects considered in this analysis for each sensitive species. Instead, impacts on desert tortoise are quantified here as an example of the extent of impacts that could occur."[35] Because the scale of each of the different rare species' ranges vary and each species has unique habitat and life cycle needs, there are no merits or science that would support the use of desert tortoise as a surrogate for the other species of concern that will be affected by this project. Therefore, the DEIS fails to actually adequately analyze the cumulative impacts of the project on the various biological resources. 0044-44

[33] DEIS, page 4-141.
[34] DEIS, page 4-139.
[35] DEIS, page 4-141.

0044-40
Cumulative Impacts
The geographic scope of the cumulative analysis for impacts to biological resources in the DEIS is limited to the Ivanpah Valley. The text has been revised to state that impacts would occur within the recovery unit.

0044-41
Cumulative Impacts
The text has been revised to address cumulative impacts to desert tortoise and states that the project would contribute to a consolidated impact and incease fragmentation within the recovery unit.

0044-42
Cumulative Impacts
The cumulative impacts have been reassessed.

0044-43
Cumulative Impacts
The DEIS states that the Proposed Action would result in cumulative impacts through vegetation loss, fragmentation, and degradation.

0044-44
Cumulative Impacts
The FEIS text assessing the cumulative impacts to biological resources has been revised to address additional special status plant species. However due to the lack of specific population and distribution of some special status species is not available for some of the planned projects, therfore a specific assessment of impacts to these special status species can not by conducted without this data.

With the statement above regarding the "substantial permanent conversion of desert habitat to industrial/commercial uses", the BLM acknowledges the possibility that all the proposed projects in the cumulative impacts analysis could be approved but has, nonetheless, failed to provide meaningful analysis of the impacts of these projects in concert— for example, the reasonably foreseeable creation of a *de facto* solar zone sprawling across the public lands along the border of two states. For BLM to continue the approval processes for these projects piecemeal without looking at them together in the context of landscape level land use planning, cumulative impacts, and growth inducing impacts violates the most basic requirements of NEPA. The BLM cannot lawfully ignore the obvious cumulative impacts to this landscape. 0044-45

Growth Inducing Impacts

The NEPA regulations also require that indirect effects including changes to land use patterns and induced growth be analyzed. "Indirect effects", include those that "are caused by the action and are later in time or farther removed in distance, but are still reasonably foreseeable. Indirect effects may include *growth inducing effects and other effects related to induced changes in the pattern of land use, population density or growth rate, and related effects on air and water and other natural systems, including ecosystems*." 40 C.F.R. s.1508.8(b) (emphasis added). *See TOMAC v. Norton*, 240 F. Supp.2d 45, 50-52 (D.D.C. 2003) (finding NEPA review lacking where the agency failed to address secondary growth as it pertained to impacts to groundwater, prime farmland, floodplains and stormwater run-off, wetlands and wildlife and vegetation); *Friends of the Earth v. United States Army Corps of Eng'rs*, 109 F. Supp.2d 30, 43 (D.D.C. 2000) (finding NEPA required analysis of inevitable secondary development that would result from casinos, and the agency failed to adequately consider the cumulative impact of casino construction in the area); *see also Mullin v. Skinner*, 756 F. Supp. 904, 925 (E.D.N.C. 1990) (Agency enjoined from proceeding with bridge project which induced growth in island community until it prepared an adequate EIS identifying and discussing in detail the direct, indirect, and cumulative impacts of and alternatives to the proposed Project); *City of Davis v. Coleman*, 521 F.2d 661 (9th Cir. 1975) (requiring agency to prepare an EIS on effects of proposed freeway interchange on a major interstate highway in an agricultural area and to include a full analysis of both the environmental effects of the exchange itself and of the development potential that it would create).

The DEIS here fails to adequately identify and analyze both the cumulative impacts and the growth inducing impacts which in this instance are closely tied together. For example, the proposed project envisions connecting to the proposed EITP transmission line upgrade and substations, which involves the construction of high voltage lines from California into Nevada and a separate telecommunications pathways. If approved, this new line could provide a compelling economic incentive for approval of the proposed project and several other industrial scale solar projects in the same valley. In addition to proposed project two other solar projects, the proposed Optisolar (First Solar) project and the Ivanpah Solar Electric Generating System, occur on federal public lands that are also high quality desert tortoise habitat with intact and robust populations of desert tortoise all within the Northeastern Recovery Unit. At minimum, these and any other significant growth that could be facilitated and/or induced by the proposed

0044-45
Cumulative Impacts
Your statement is included in the public record and will be taken into account by decision-makers when they consider the proposed project.

project and the necessary transmission line upgrade should have been fully considered as indirect effects (or "secondary" or "induced" effects) attributable to the proposed project.

This growth inducing effect of the transmission line which is necessary for the proposed project is essentially ignored in the DEIS. In fact, the combined projects if approved will likely create a momentum that would virtually ensure approval of additional solar power projects on prime desert tortoise habitat in the Ivanpah Valley. Arguably, the proposed project alone could not amortize the cost of the line upgrade. The cumulative impacts from these connected proposed projects on the North Ivanpah Valley are not adequately assessed and the growth inducing impacts from the approval of these projects on the Ivanpah Valley and BLM's ongoing PEIS planning is not adequately identified, assessed or analyzed. Cumulative impacts and growth inducing impacts of the several proposed projects, if approved, would turn Ivanpah Valley into a *de facto* solar zone and industrial zone. The most obvious effect would be the conversion of a largely natural area – the Ivanpah Valley and dry lake area as a whole—into a largely industrialized area with more than 6 large scale solar plants, the accompanying substations and power lines, glare and heat islands that will be created across the "zone." 0044-46

A supplemental DEIS must be prepared to remedy the legally required analysis gaps.

III. The DEIS Violates the Endangered Species Act by Failing to Adequately Identify and Analyze Impacts to the Desert Tortoise in Order to Insure Against Jeopardy and Support Recovery.

As discussed above, BLM's failure to adequately address impacts to the desert tortoise in the DEIS fails to comply with NEPA. In addition, the preferred alternative proposes to translocate desert tortoises off-site as mitigation, despite numerous documented failures of this type of action. Nowhere in the DEIS is there any description of the details regarding this translocation, including the identification of the receiving site.

The ESA was enacted, in part, to provide a "means whereby the ecosystems upon which endangered species and threatened species depend may be conserved...[and] a program for the conservation of such endangered species and threatened species..." 16 U.S.C. § 1531(b). The ESA "is the most comprehensive legislation for the preservation of endangered species ever enacted by any nation." *Tennessee Valley Authority v. Hill*, 437 U.S. 153, 180 (1978). The Supreme Court's review of the ESA's "language, history, and structure" convinced the Court "beyond a doubt" that "Congress intended endangered species to be afforded the highest of priorities." *Id.* at 174. As the Court found, "the plain intent of Congress in enacting this statute was to halt and reverse the trend toward species extinction, whatever the cost." *Id.* at 184.

Section 2(c) of the ESA establishes that it is "...the policy of Congress that all Federal departments and agencies shall seek to conserve endangered species and threatened species and shall utilize their authorities in furtherance of the purposes of this Act." 16 U.S.C. § 1531(c)(1). The ESA defines "conservation" to mean "...the use of all methods and procedures which are necessary to bring any endangered species or threatened species to the point at which the measures provided pursuant to this Act are no longer necessary." 16 U.S.C. § 1532(3).

0044-46
Cumulative Impacts
The cumulative and growth inducing impacts analysis fully meet the requirements of NEPA.

Similarly, Section 7(a)(1) of the ESA directs that federal agencies to "utilize their authorities in furtherance of the purposes" of the ESA. 16 U.S.C. § 1536(a)(1)..

In order to fulfill the substantive purposes of the ESA, Federal agencies, such as BLM in this instance, are required to engage in consultation with the Fish and Wildlife Service to "insure that any action authorized, funded, or carried out by such agency...is not likely to jeopardize the continued existence of any endangered species or threatened species or result in the adverse modification of habitat of such species... determined...to be critical..." 16 U.S.C. § 1536(a)(2) (Section 7 consultation). Section 7 consultation is required for "any action [that] may affect listed species or critical habitat." 50 C.F.R. § 402.14. As part of the consultation, the action agency must first prepare a biological assessment. 16 U.S.C. § 1536(c)(1). Although procedural, consultation is the backbone of the ESA. As the Ninth Circuit recognized, "[o]nly by requiring substantial compliance with the act's procedures can we effectuate" Congressional intent to protect species. *Sierra Club v. Marsh*, 816 F.2d at 1384 (9th Cir. 1987).

As part of the proposed project BLM has initiated consultation with the Fish &Wildlife Service ("Service") regarding impacts to the threatened desert tortoise and its habitat in order to ensure against jeopardy and provide for the conservation of the species. *See Nat'l Wildlife Fed'n v. NMFS*, 524 F.3d 917, 933 (9th Cir. 2008) (holding that the ESA requires consideration of impacts to species' prospects for recovery in jeopardy analysis). In order to engage in meaningful consultation the agencies must have adequate information regarding the baseline status of the species in the area of the proposed project as well as adequate identification and analysis of the likely impacts of the project on the species and its habitat and the long-term conservation of the species including direct, indirect and cumulative impacts. In this instance, the Service must be provided with sufficient information to determine the impacts of the proposed project on the tortoise including the degree to which the proposed project could undermine the species' ability to recover in light of direct, indirect and cumulative impacts of the proposed project as well as other threats (including climate change and the need to preserve healthy tortoise populations that will well suited and positioned to adapt to rapid changes.).

Protocol level surveys for desert tortoise on the proposed project site identified the on-site population to be within a range of 42 to 123 tortoises, the actual number of desert tortoises on site is likely much higher, based on the effectiveness of protocol level surveys on finding all onsite tortoises[36], especially given the vast number of acres of the proposed project site. Based just on the number of documented tortoises, the project site supports a similar population density of desert tortoise to the Northeastern Recovery Unit's documented density within the DWMAs.[37] Thus the survey data confirms that this area is moderate to high quality desert tortoise habitat with a population that is at least as robust as those within the DWMAs and should be protected as such.

[36] Anderson, D.R., K.P. Burnham, B.C. Lubow, L. Thomas, P.S. Corn, P.A. Medica and R.W. Marlow 2001. Field Trials of Line Transect Methods Applied to Estimation of Desert Tortoise Abundance. Journal of Wildlife Management 65(3): 583-597.

[37] USFWS. 2009. Draft Biological Opinion for the Proposed Addition of Maneuver Training Lands at Fort Irwin, California (8-8-09-F-43R). Page 48.

As previously noted, this particular Recovery Unit is host to three different unique genetic types one of which occurs in the Ivanpah valley.

Of particular concern is the failure by BLM to provide the public and FWS any kind of translocation plan for review, rather stating such a plan would be prepared in the future. The DEIS does disclose that, "Capturing, handling, and relocating desert tortoises from the Proposed Project site after the installation of the fencing would result in harassment and may also result in death or injury. This is particularly true if relocation[38] methods are performed improperly, such as during extreme temperatures, or if tortoises void their bladders due to handling stress, leaving them susceptible to severe dehydration."[39] 0044-47

To date, translocation of desert tortoise always results in "take" of tortoises and certainly does not aide in the recovery of the threatened species. Even "successful" translocation has been documented to have a15-21% mortality[40]. Significant losses of tortoises through the most recent translocation effort in 2008 - the Fort Irwin translocation - resulted in over 20% mortality within the first year. Further monitoring has documented as of August 2009, over 250 desert tortoise (38%) have died in the translocation areas of Fort Irwin[41]. This translocation has resulted in further declines in the west Mojave recovery unit to the detriment of recovery of the species as a whole.

The Scientific Advisory Committee of the U.S. Fish and Wildlife Service's Desert Tortoise Recovery Office has recently concluded that "translocation is fraught with long-term uncertainties, notwithstanding recent research showing short-term successes, and should not be considered lightly as a management option. When considered, translocation should be part of a strategic population augmentation program, targeted toward depleted populations in areas containing "good" habitat. The SAC recognizes that quantitative measures of habitat quality relative to desert tortoise demographics or population status currently do not exist, and a specific measure of "depleted" (e.g., ratio of dead to live tortoises in surveys of the potential translocation area) was not identified.[42] The proposed project can hardly be considered a "strategic augmentation program". 0044-48

[38] The terms "relocation" and "translocation" are not clearly defined at present by BLM or FWS. In some recent documents BLM has stated that short-distance movement of tortoises might be considered "relocation" and not require certain precautions be taken prior to movement – including disease testing. The Center is concerned that the distance has recently changed from 1km to 5 km without proper scientific support and we note that there is an ongoing debate among desert tortoise scientists regarding this issue. Therefore, in these comments the Center continues to use the term "translocation" to apply to all proposed movement of tortoises off of the project site into other area.

[39] DEIS, page 4-46. 0044-49

[40] Field, K.J., C. R. Tracy, P.A. Medica, R.W. Marlow, P.S. Corn 2007. Return to the Wild: Translocation as a Tool in Conservation of the Desert Tortoise (Gopherus agassizi). Biological Conservation 136: 232-245; and, Nussear, K.E. 2004. Mechanistic investigation of the distributional limits of the desert tortoise *Gopherus agassizii*. PhD dissertation. University of Nevada, Reno. Pgs. 213.

[41] USFWS. 2009. Draft Biological Opinion for the Proposed Addition of Maneuver Training Lands at Fort Irwin, California (8-8-09-F-43R). Page 48.

[42] USFWS. 2009. Scientific Advisory Committee (SAC), Desert Tortoise Recovery Office. Meeting Summary, March 13, 2009, San Diego Wild Animal Park, Escondido, CA. pgs 4. http://www.fws.gov/Nevada/desert_tortoise/documents/sac/20090313_SAC_meeting_summary.pdf

0044-47
Biology - Desert Tortoise
The final relocation/translocation plan will be outlined in the Biological Opinion that will be issued by USFWS. This plan will follow USFWS's May 2010 Translocation of Desert tortoises (Mojave Population) from Project Sites: Plan Development Guidance and will address the following issues: selection of the translocation site; selection of a control site (if five or more tortoises are to be translocated); determination of the health of tortoises (translocatees and residents); methods to be used during the translocation process; and post-translocation monitoring (minimum 5-years) of the translocated individuals. Only healthy tortoises, as determined by the results of a health assessment of each tortoise, will be translocated. Additionally, the translocation site will be located within the same habitat type and consists of a desert tortoise population of similar size and structure (genetic included) as the Project Site. To determine the success of the translocation of the tortoises, a control site of similar size, habitat, and desert tortoise population to that of the relocation site will be monitored and compared to.

0044-48
Biology - Desert Tortoise
The final relocation/translocation plan will be outlined in the Biological Opinion that will be issued by USFWS. This plan will follow USFWS's May 2010 Translocation of Desert tortoises (Mojave Population) from Project Sites: Plan Development Guidance and will address the following issues: selection of the translocation site; selection of a control site (if five or more tortoises are to be translocated); determination of the health of tortoises (translocatees and residents); methods to be used during the translocation process; and post-translocation monitoring (minimum 5-years) of the translocated individuals. Only healthy tortoises, as determined by the results of a health assessment of each tortoise, will be translocated. Additionally, the translocation site will be located within the same habitat type and consists of a desert tortoise population of similar size and structure (genetic included) as the Project Site. To determine the success of the translocation of the tortoises, a control site of similar size, habitat, and desert tortoise population to that of the relocation site will be monitored and compared to.

0044-49
Biology - Desert Tortoise
Your statement is included in the public record and will be taken into account by decision-makers when they consider the proposed project.

These data and conclusions by desert tortoise experts negate any logical basis for presenting translocation as aiding in recovering the species. The risks associated with translocation in general are now well established and quite high[43]. Because of this, the agencies need to take seriously a full and honest evaluation of the need, if any, to site projects within essential, occupied desert tortoise habitat. Siting projects in areas that lack desert tortoise will preclude the need for translocation and the inevitable mortality that translocation causes. 0044-50

If translocation must occur as part of the project implementation, the translocation plan needs to be thoroughly developed and vetted by knowledgeable tortoise science and management experts and provided for public review.

Any plan must thoroughly address a number of essential desert tortoise issues. 0044-51

Disease issues

The health of the desert tortoises that are on the site and proposed for translocation as well as the "host" tortoises in areas into which the translocated tortoises will be moved must be evaluated and addressed. Regardless of the proximity of the translocated and host tortoises, data still needs to be collected on the state of the population at a minimum to help inform the results of the translocation. If disease is present in either the translocated tortoises or "host" tortoises, concentrating tortoises into off-site areas may exacerbate disease transmission and outbreaks especially coupled with the stresses of translocation, competition for scarce resources, defense of existing territories (host population), establishment of new territories (relocated population), etc. 0044-52

Carrying Capacity

The carrying capacity of the translocation sites, and their ability to support greater tortoise densities over the long-term must be assessed. While a die-off of tortoises is known from the Ivanpah Valley in the 1990's, there is no evidence presented in any of the documents that the habitat has the capacity to provide resources to sustain over the long-term a higher density population. In light of global climate change and its effects currently occurring on the desert[44], the habitat may simply not be able to support a more concentrated population now or into the future.

Monitoring

Not only should the translocated tortoises be monitored but it is essential that the "host" tortoises also be monitored, to truly evaluate the status of the translocation. Rigorous monitoring needs to be included in the plan.

[43] Dodd, C.K. and R.A. Seigel 1991. Relocation, repatriation and translocation of ampibians and reptiles: are they conservation strategies that work? Herpetologica 47(3): 336-350.

[44] Kelly, A. E. and M.L. Goulden 2008. Rapid shifts in plant distribution with recent climate change. *Proc Natl Acad Sci USA* 105:11823–11826.

0044-50
Biology - Desert Tortoise
Your statement is included in the public record and will be taken into account by decision-makers when they consider the proposed project.

0044-51
Biology - Desert Tortoise
The FEIS will address the essential desert tortoise issues. Both the direct and indirect impacts to desert tortoise have been evaluate along with the cummulative and residual effects. The FEIS will also included the conclusions the Biological Assessment.

0044-52
Biology - Desert Tortoise
The final relocation/translocation plan will be outlined in the Biological Opinion that will be issued by USFWS. This plan will follow USFWS's May 2010 Translocation of Desert tortoises (Mojave Population) from Project Sites: Plan Development Guidance and will address the following issues: selection of the translocation site; selection of a control site (if five or more tortoises are to be translocated); determination of the health of tortoises (translocatees and residents); methods to be used during the translocation process; and post-translocation monitoring (minimum 5-years) of the translocated individuals. Only healthy tortoises, as determined by the results of a health assessment of each tortoise, will be translocated. Additionally, the translocation site will be located within the same habitat type and consists of a desert tortoise population of similar size and structure (genetic included) as the Project Site. To determine the success of the translocation of the tortoises, a control site of similar size, habitat, and desert tortoise population to that of the relocation site will be monitored and compared to.

Objectives and Analyses

Criteria of success must identified in the translocation plan. Monitoring must be tied to triggers for action, adaptive management, or success criteria. Benchmarks for success need to be identified and additional requirements put in place to mitigate failures of this experimental proposal.

Timing

Translocation of desert tortoise should be done in spring when possible. Translocation in the fall is not optimal especially if summer/fall rains do not occur. If translocation must occur, flexibility in timing is essential to help to assure successful translocation to help meet the minimization standard.

Long-term assurances

Measures must be put in place to assure the long-term protection of the desert tortoises that are moved and the habitat into which they are moved. As the BLM is well aware, multiple projects are proposed for this same area, and other areas in the Mojave Desert. Assurances must be included so that the desert tortoise affected by this project are not impacted again by a subsequent project. We remain concerned however, that lacking a comprehensive strategy for tortoise conservation. Tortoises could be translocated multiple times, which clearly will be detrimental to the species and its recovery.

4. The DEIS Fails to Adequately Identify, Analyze and Off-set Impacts from GHG Emissions.

Federal courts have squarely held that NEPA requires federal agencies to analyze climate change impacts. *Center for Biological Diversity v. National Highway Traffic Safety Administration*, 508 F.3d 508 (9th Cir. 2007). As most relevant here, NEPA requires consideration of greenhouse gas emissions ("GHG emissions") associated with all projects and, in order to fulfill this requirement the agencies should look at all aspects of the project which may create greenhouse gas emissions including operations, construction, and life-cycle emissions from materials. Where a proposed project will have significant GHG emissions, the agency should identify alternatives and/or mitigation measures that will lessen such effects.

As part of the NEPA analysis federal agencies must assess and, wherever possible, quantify or estimate GHG emissions by type and source by analyzing the direct operational impacts of proposed actions. Assessment of direct emissions of GHG from on-site combustion sources is relatively straightforward. For many projects, as with the proposed project, energy consumption will be the major source of GHGs. While the proposed project will not have significant operational GHG emission, emissions from construction should be identified, minimized and off set. The DEIS notes: "Active tracking PV solar energy systems do not directly generate GHG emissions, but the equipment manufacturing process does emit GHGs. In addition, on-site

construction and operations using combustion engines can specifically generate CO2 and CH4, although at levels much lower than equivalent coal, oil, or natural gas-fired electrical generation facilities."[45] The DEIS also quantifies the GHG emissions for construction over a 4 year period and states that similar emissions would occur at decomissioning.[46] However, no alternatives are provided that would reduce these sources by using alternative fuels or highly efficient vehicles and equipment and no mitigation measures are provided to reduce or off-set the GHG emissions that are identified. 0044-53

No estimates are provided on the lifecycle GHG emissions for the project components or the loss of carbon sequestration capacity on site. The indirect effects of a project may be far-reaching and require careful analysis. Within this category, for example, the BLM should evaluate, GHG and GHG-precursor emissions associated with construction, electricity use, fossil fuel use, water consumption, waste disposal, transportation, the manufacture of building materials (lifecycle analysis), and land conversion. Moreover, because the project may undermine or destroy the value of carbon sinks found in desert soils, the project may have additional indirect effects from reduction in carbon sequestration, therefore both the direct and quantifiable GHG emissions as well as the GHG effects of destruction of carbon sinks should be analyzed. 0044-54

5. Impacts of Potential Cadmium Pollution are not Addressed

Thin film solar panels contain the material cadmium telluride, which enhances the energy gathering efficiency of the panel.[47] Both components cadmium and telluride are toxic, although the greatest concern is with cadmium. Cadmium has been long recognized as a highly toxic chemical, and a carcinogen, with adverse impacts on human health and well-being. It is highly harmful even in low concentrations and will bio-accumulate in organisms and the environment.[48] The European Union in its "Restriction of Hazardous Substances Directive" restricts the use of six hazardous materials, including cadmium, in the manufacture of various types of electronic and electrical equipment due to the high degree of hazard to human health.[49]

The DEIS failed to carefully analyze the use of thin cell solar panels containing cadmium telluride, and disclose the potential impacts to human health and the environment in the event it is eroded from the panels or otherwise released into the environment. 0044-55

A supplemental DEIS must be prepared which fills this important analysis and disclosure gap.

Conclusion

Thank you for your consideration of these comments. In light of the inadequacy of the environmental review to date, we urge the BLM to revise and re-circulate the DEIS or prepare a supplemental DEIS before making any decision regarding the proposed plan amendment and

[45] DEIS, page 1-9.
[46] DEIS, page 4-3.
[47] http://en.wikipedia.org/wiki/CdTe
[48] http://en.wikipedia.org/wiki/Cadmium_poisoning
[49] http://en.wikipedia.org/wiki/RoHS

0044-53
Greenhouse Gases
The GHG emissions for each year of construciton are estimated to be less than 25,000 metric tons CO2e. This is the level the Council on Environmental Quality recommends that federal agencies should consider as an indicator of additional discussion. Thus, since GHG emissions would be short-term and below the levels described above, mitigation measures to reduce GHG emissions were not developed.

0044-54
Greenhouse Gases
Section 4 summarized the indirect GHG emissions associated with the project (i.e., emissions generated from project construction activities). Electricity used to power facility equipment would come from the project itself. A life-cycle calculation of GHG emissions associated with the manufacture of solar panels and other building materials and desert CO2 sequestration would be speculative and beyond the scope of this EIS. Further, there is not data to suggest that the project would interfere with the current mechanisms of CO2 flux in the desert ecosystem.

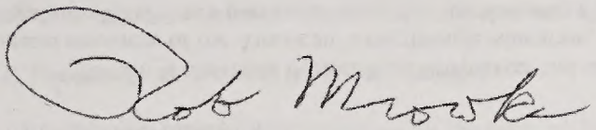
0044-55
Hazardous Materials
The analysis of operation and maintenance effects disclosed in the DEIS acknowledges the potential presence of hazardous materials in PV panel components. The DEIS also discloses that although solar PV panels would be sealed under normal operating conditions, materials within the panels could be released if they were damaged or improperly disposed. Even though Cadmium Telluride is known as a common component of thin film solar cells, the final selection of the solar PV panels and specific contents of any hazardous substances is currently unknown. Despite the final selection of the solar PV panel technology to be used in this project, the applicant will have to handle and dispose these materials in compliance with the federal RCRA and state and local regulations.

right-of-way application. Such an effort would also provide an opportunity in the NEPA process for the proponent to introduce ideas they have developed in separate discussions with interested stakeholders.

In the event BLM chooses not to revise the DEIS and provide adequate analysis, the BLM should reject the right-of-way application.

Please feel free to contact us if you have any questions about these comments. The Center will be providing the literature cited in these comments soon by means of a DVD.

Sincerely Yours in Conservation,



Rob Mrowka
Ecologist/Nevada Conservation Advocate

CC: Bob Williams, USFWS

Western Watersheds Project

Michael J. Connor, Ph.D.
California Director
P.O. Box 2364, Reseda, CA 91337-2364
Tel: (818) 345-0425
Email: mjconnor@westernwatersheds.org
Web site: www.westernwatersheds.org

Working to protect and restore Western Watersheds

May 31, 2010

BY EMAIL

BLM, Las Vegas Field Office
Attn: Greg Helseth
Renewable Energy Project Manager
4701 N. Torrey Pines Drive
Las Vegas, NV 89130

E-mail: < Nextlight_Primm_NV_SEP@blm.gov >

RE: Notice of Availability of the Draft Environmental Impact Statement for the NextLight Renewable Power, LLC, Silver State Solar Project, Primm, NV (FR, 4/16/10, pp. 19990-91)

Dear Mr. Helseth:

Western Watersheds Project is pleased to provide the following comments on the Draft Environmental Impact Statement for the NextLight Renewable Power, LLC, Silver State Solar Project, Primm, NV ("SDEIS"). The closing date for public comment is May 31, 2010 so these comments are timely filed. Please incorporate and address our comments in the planning for this proposed power plant project.

Western Watersheds Project works to protect and conserve the public lands, wildlife and natural resources of the American West through education, research, public policy initiatives and litigation. WWP has a particular interest in the Nevada - California border desert lands and our staff and members use and enjoy the project area's public lands and fragile resources.

The proposed Silver State Solar Power Plant project would be located on relatively undisturbed public lands and will have significant direct, indirect and cumulative impacts on desert tortoises and their habitat, rare plants, and visual resources. The proposed action (Alternative 2) would disturb up to 2,967 acres of land. As we discuss below, the BLM has failed to consider and analyze alternatives that would allow the project to proceed without impacting desert tortoises and other resources. BLM's documentation of the impacts of the proposed action is inadequate and does not take the "hard look" at the environmental impacts of this project required by the National Environmental Quality Act ("NEPA"). Without undertaking a frank and honest presentation and analysis of impacts it is impossible to evaluate the adequacy of any proposed mitigation. If the BLM is not prepared to take the requisite hard look it must deny the right-of-way application.

(1) The Purpose and Need are Too Narrowly Defined.

0045-1

BLM states that "The purpose of the Proposed Action is to consider a ROW grant to construct, operate, maintain, and decommission a solar energy project on public lands administered by the BLM" (DEIS at ES-1) and the need is because "The BLM is required to respond to the application under Title V of FLPMA for a ROW grant to construct, operate, maintain, and decommission a solar PV facility on BLM lands" (DEIS at ES-2). The NEPA regulations require that federal agencies "specify the underlying purpose and need to which the agency is responding in proposing the alternatives including the proposed action." 40 C.F.R. § 1502.13. For the BLM to comply with NEPA, it cannot simply construe that the need for a project is what an applicant has asked for in an application since an applicant could ask for any number of things, and only one alternative would satisfy whatever the applicant has asked for. To comply with NEPA, BLM needs to revisit the fundamental purpose and need for this project so that reasonable alternatives can be that developed and analyzed.

(2) The Range of Alternatives is Too Narrow.

The consideration of alternatives "is the heart of the environmental impact statement." 40 C.F.R. § 1502.14. The NEPA implementing regulations specify that NEPA documents must analyze a full range of alternatives. Based on the information and analysis presented in the sections on the Affected Environment (40 C.F.R. § 1502.15) and the Environmental Consequences (40 C.F.R. § 1502.16), the NEPA document should present the environmental impacts of the proposed action and the alternatives in comparative form, thus sharply defining the issues and providing a clear basis for choice among options by the decisionmaker and the public. NEPA requires agencies to "Use the NEPA process to identify and assess the reasonable alternatives to proposed actions that will avoid or minimize adverse effects of these actions upon the quality of the human environment." 40 C.F.R. § 1500.2.

In this case, BLM has analyzed three alternatives in the DEIS: "no action" (Alternative 1); the proposed action, the Proponent's proposal that would disturb up to 2,967 acres of land and would include the use of berms to reduce erosion (Alternative 2); and a third alternative that would disturb up to 4,818 acres of land and would employ an alternate drainage and flood control design to control erosion (Alternative 3). Both action alternatives would use solar PV technology, although the specific types of arrays and trackers have not been determined at this time. Despite the requirement "to identify and assess the reasonable alternatives to proposed actions that will avoid or minimize adverse effects" the BLM has considered no alternative that would reduce or minimize environmental impacts but still allow the project to proceed. The only alternative the BLM has considered besides the proposed action of issuing the right-of-way permit and not issuing the right-of-way permit is one that would increase the impacts of the project. Since this was not requested by the project proponent we can only surmise that the BLM used this alternative as a "straw man" to make the proposed action appear to have less impact. This is in clear violation of the spirit and intent of NEPA.

0045-2

The BLM should consider additional alternatives in a supplemental draft EIS that reduce adverse environmental impacts. Such alternatives should include (1) reducing the project

0045-3

0045-1
Purpose and Need
Many factors were used in development of the purpose and need for the project. First, BLM is obligated to respond to a valid right of way application filed on lands that are open under the public land laws. Second, BLM considered several federal mandates to promote renewable energy on its lands, including the Energy Policy Act of 2005 and several presidential executive orders. The applicant has considered other sites to build solar energy projects, some of which are being pursued on both public and private lands throughout the West. Finally, the purpose and need for the project allowed a reasonable range of alternatives which were driven by the analysis and feasibility.

0045-2
Alternatives
BLM considered a reasonable range of alternatives consistent with NEPA and BLM policies and procedures. The two action alternatives satisfy the purpose and need in that they fulfill BLM's obligation to consider the ROW application, meet federal renewable energy mandates and respond to impacts identified in the NEPA analysis.

0045-3
Alternatives
The analysis revealed that impacts under the 2 action alternatives would occur, but that reducing the size of the project would not reduce impacts appreciably. While the proposed project is located within desert tortoise habitat, that habitat is not identified as critical. Any desert tortoises will be relocated or translocated in accordance with the approved Desert Tortoise Recovery Plan and protocols of the US Fish and Wildlife Service and Nevada Department of Wildlife. In addition, moving the project to another location would not have been consistent with the purpose and need statement.

footprint, and (2) locating the project at a site that is not desert tortoise habitat and that has less resource conflicts.

(3) The DEIS Fails to Take the Requisite "Hard Look" at the Environmental Impacts of the Project

Desert Tortoise.

The proposed power plant project will have severe direct, indirect and cumulative impacts on the Northeastern Mojave desert tortoise population. The impacts include destruction and loss of habitat, take of tortoises, habitat fragmentation, population fragmentation, loss of connectivity, and loss of viability.

The proposed project site is on the Nevada-California border immediately north of the Ivanpah Desert Wildlife Management Area. The desert tortoises in this area are part of the Northeastern Mojave Evolutionarily Significant Unit ("ESU") as recognized in the 1994 *Desert Tortoise (Mojave Population) Recovery Plan.* More recent studies indicate that the Northeastern Mojave ESU tortoises consist of at least three genetically distinguishable populations; the tortoises in this area being assignable to the South Las Vegas unit (Britten *et al*, 1997[1]; Hagerty 2008[2]). The 1994 *Desert Tortoise (Mojave Population) Recovery Plan* proposed including the project site within a DWMA (USFWS 1994 at 41). 0045-4

The DEIS at 3-36 provides an estimate of 88 tortoises on the project site i.e. 19 per square mile or 7.3 sq km. This is a relatively high number of desert tortoises. It does not include the unknown number of resident tortoises at any translocation site(s) that may be affected nor tortoises that may be impacted by the increased use of roads in the area. Unfortunately, this estimate of 88 tortoises is a gross approximation due to the inadequacy of the survey methodology that was used. The field surveys were performed in October 2008 and August 2009 i.e. outside the protocol seasons. The methodology used was TRED sampling but desert tortoise calibration surveys were not conducted. Thus both the accuracy and precision of the abundance assessment for desert tortoise on the site are low. Without crucial data on the number of tortoises on the site, the BLM can neither estimate the extent of the impacts nor the likely success of any relocations or translocations. 0045-5

Considering the extensive habitat fragmentation and connectivity impacts associated with existing and planned developments within Primm/Ivanpah Valley, the importance of protecting remaining habitat to allow for desert tortoise population connectivity and long-term persistence is essential. The DEIS fails to provide meaningful analyses of the project's habitat-fragmentation and population-fragmentation effects nor of the projects effects on connectivity. Connectivity between desert tortoise populations is essential to maintain gene flow and genetic heterogeneity. The DEIS provides no discussion or analysis. 0045-6

[1] Britten, H. B., Riddle, B. R., Brussard, P. F., Marlow, R. and Lee, Jr., T. E. 1997. Genetic delineation of management units for the desert tortoise, Gopherus agassizii, in the northeastern Mojave Desert. Copeia 1997: 523-530.

[2] Hagerty, B. 2008. Ecological Genetics of the Mojave Desert Tortoise. PhD. Dissertation. University of Nevada, Reno. 244 pp.

0045-4
Biology - Desert Tortoise
The final relocation/translocation plan will be outlined in the Biological Opinion that will be issued by USFWS. This plan will follow USFWS's May 2010 Translocation of Desert tortoises (Mojave Population) from Project Sites: Plan Development Guidance and will address the following issues: selection of the translocation site; selection of a control site (if five or more tortoises are to be translocated); determination of the health of tortoises (translocatees and residents); methods to be used during the translocation process; and post-translocation monitoring (minimum 5-years) of the translocated individuals. Only healthy tortoises, as determined by the results of a health assessment of each tortoise, will be translocated. Additionally, the translocation site will be located within the same habitat type and consists of a desert tortoise population of similar size and structure (genetic included) as the Project Site. To determine the success of the translocation of the tortoises, a control site of similar size, habitat, and desert tortoise population to that of the relocation site will be monitored and compared to.

0045-5
Biology - Desert Tortoise
Section 3.6 Biology / Section 3.6.3.2 Reptiles The FEIS text has been revised to include the methods and results of the 2010 spring desert tortoise surveys. During 2010 spring, one-hundred percentage surveys were conducted within the Phase I portion of the Proposed Project and within the proposed relocation site. Update estimates of desert tortoise densities were calculated from the 2010 spring surveys. All analysis of potential impacts to desert tortoise have been update to incorporate the new density estimates resulting from the 2010 spring surveys.

0045-6
Biology - Desert Tortoise
Section 4.6.1 Indicators Biological Resources The text within the FEIS has been revised to address this comment.

0045-7

The footprint of the proposed power plant will consume some 2,967 acres. Mitigating for direct impacts on this scale is difficult. However, other major projects are also being proposed in the area. In the face of the massive cumulative habitat loss and fragmentation that will occur if these projects proceed, the viability of the Ivanpah valley tortoise population may be placed at risk.

0045-8

No final translocation plan has been made available for to the public to review. The BLM must make this available for public comment prior to issuing its decision. BLM Handbook 1745 requires that activity plans for translocations must be site-specific and include "Site-specific and measurable vegetation/habitat population objectives which are based on existing ecological site potential/condition, habitat capability, and other important factors." The DEIS does not adequately describe existing ecological conditions nor does it address the capacity of the habitat at the translocation sites to support additional tortoises.

0045-9

Environmental stressors may contribute to disease outbreaks in desert tortoise populations particularly Upper Respiratory Tract Disease (Sandmeier *et al.*, 2009[3]). The BLM should require that the health status of resident and translocated tortoises be evaluated so that movement of *Mycoplasma* infected tortoises can be controlled.

0045-10

Bighorn Sheep.

The DEIS fails to fully analyze impacts to bighorn sheep, provide alternatives to avoid these impacts, or provide measures to minimize these impacts. The DEIS baldly states, "The closest range to the Proposed Project, the Lucy Gray Mountain Range, is historically unoccupied by desert bighorn sheep (BLM GIS). Due to the location of the Proposed Project, desert bighorn sheep may use the Proposed Project site during their migration between these ranges; however, occurrence is expected to be rare." DEIS at 3-40. The DEIS provides no analysis of the significance of these impacts of the project on bighorn sheep migration.

0045-11

Rare Plants.

The project site provides occupied habitat for the White margin Beardtongue or White Margin Penstemon (*Penstemon albomarginatus*) and other rare plants. According to the DEIS, "field surveys for vegetation are being conducted in the spring of 2010 by Sycamore Environmental Consultants". Without this data, neither the decisionmaker nor the public can use the NEPA documents to make informed decisions. Without this data, the BLM can neither claim to have taken the requisite "hard look" at the environmental impacts of the project nor can it certify that it is avoiding undue degradation as it is required to do under FLPMA.

0045-12

ACEC.

Contrary to the statement made in the DEIS (at 3-60), the closest ACEC is immediately adjacent to the project site on the California side of the border. The Ivanpah DWMA is an ACEC was created to protect desert tortoise. The proposed project will impact tortoise movement into and out of this DWMA. The governing 1988 RMP for the Resource Area calls for (our emphasis added):

[3] Sandmeier, F. C., Tracy, C. R., duPré, S. and Hunter. K. 2009. Upper respiratory tract disease (URTD) as a threat to desert tortoise populations: A reevaluation. Biological Conservation. 142: 1255-1268.

0045-7
Biology - Desert Tortoise
The cumulative section addressed the potential cumulative impacts to desert tortoise.

0045-8
Biology - Desert Tortoise
The final relocation/translocation plan will be outlined in the Biological Opinion that will be issued by USFWS. This plan will follow USFWS's May 2010 Translocation of Desert tortoises (Mojave Population) from Project Sites: Plan Development Guidance and will address the following issues: selection of the translocation site; selection of a control site (if five or more tortoises are to be translocated); determination of the health of tortoises (translocatees and residents); methods to be used during the translocation process; and post-translocation monitoring (minimum 5-years) of the translocated individuals. Only healthy tortoises, as determined by the results of a health assessment of each tortoise, will be translocated. Additionally, the translocation site will be located within the same habitat type and consists of a desert tortoise population of similar size and structure (genetic included) as the Project Site. To determine the success of the translocation of the tortoises, a control site of similar size, habitat, and desert tortoise population to that of the relocation site will be monitored and compared to.

0045-9
Biology - Desert Tortoise
The final relocation/translocation plan will be outlined in the Biological Opinion that will be issued by USFWS. This plan will follow USFWS's May 2010 Translocation of Desert tortoises (Mojave Population) from Project Sites: Plan Development Guidance and will address the following issues: selection of the translocation site; selection of a control site (if five or more tortoises are to be translocated); determination of the health of tortoises (translocatees and residents); methods to be used during the translocation process; and post-translocation monitoring (minimum 5-years) of the translocated individuals. Only healthy tortoises, as determined by the results of a health assessment of each tortoise, will be translocated. Additionally, the translocation site will be located within the same habitat type and consists of a desert tortoise population of similar size and structure (genetic included) as the Project Site. To determine the success of the translocation of the tortoises, a control site of similar size, habitat, and desert tortoise population to that of the relocation site will be monitored and compared to.

0045-10
Biology - General
Section 4.6.5 Residual Effects Wildlife provides an assessment of the impacts to bighorn sheep:

"As currently designed, the Proposed Project would have localized, adverse, short- and long-term impacts on individuals of these species. The following mitigation measures are recommended to further reduce the potential for impacts to desert bighorn sheep:"

0045-11
Biology - Plants
The 2010 spring botanical survey did not detect the presence of white-margined beardtongue in the Proposed Project site; the Proposed Project will not directly impact this species.

0045-12
Biology - Desert Tortoise
The text has been changed to identify The Ivanpah DWMA/ACEC as the closest ACEC to the Proposed Project areas located immediately southwest of the Proposed Project area. The Proposed Project area does not directly border the Ivanpah DWWA/ACEC, and the size of the Proposed Project area is very small compared to the size of the Ivanpah DWWA/ACEC, and not pose a significant barrier for the movement of tortoises in and out of the Ivanpah DWWA/ACEC.

AC-1. Establish areas of critical environmental concern specifically for management of desert tortoise within the Northeastern Mojave and Eastern Mojave recovery units identified in the Tortoise Recovery Plan (SS-3la)(see Table 2-2). Manage a sufficient quality and quantity of desert tortoise habitat, which in combination with tortoise habitat on other Federal, State and private land, will meet recovery plan criteria. Maintain functional corridors of habitat between areas of critical environmental concern to increase the chance of long-term persistence of desert tortoise populations within the recovery unit.

The BLM needs to analyze the impacts of the proposed project on this ACEC in the NEPA analysis.

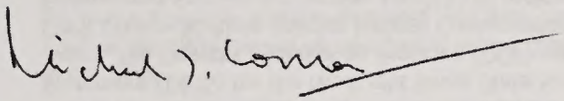
Visual Resources.

Visual resources are important public resources identified in FLPMA. The DEIS fails to adequately analyze the full impacts that this project would have on the region's visual resources. The Visual Resources section should be rewritten.

0045-13

Western Watersheds Project thanks you for this opportunity to provide comments on the DEIS. Please keep Western Watersheds Project informed of all further substantive stages in this NEPA process and document in the record our involvement as members of the 'interested public'. If you have any questions, please feel to call me at (818) 345-0425 or e-mail me at <mjconnor@westernwatersheds.org>.

Sincerely,



Michael J. Connor, Ph.D.
California Director
Western Watersheds Project
P.O. Box 2364
Reseda, CA 91337
(818) 345-0425
<mjconnor@westernwatersheds.org>

0045-13
Visual Resources
Thank you for your comment. The visual resources section was written in consultation with BLM visual resources specialists and according to the BLM visual resource assessment methodology as described in Section 3.12.1.

May 28, 2010

Greg Helseth
Renewable Energy Project Manager
Bureau of Land Management
4701 N. Torrey Pines Drive
Las Vegas, NV 89130

RE: N-085077 2800 (NVS3100)

Mr. Helseth,

Thank you for the opportunity to comment on the Draft Environmental Impact Statement (DEIS) for the NextLight Silver State Solar Project (project). As you may be aware, the Desert Conservation Program (DCP) serves as the Plan Administrator for the Clark County Multiple Species Habitat Conservation Plan (MSHCP) in support of an Endangered Species Act section 10(a)(1)(B) incidental take permit for the Cities of Boulder City, Henderson, Las Vegas, Mesquite and North Las Vegas; the County and the Nevada Department of Transportation. The current permit covers 78 species, including the threatened desert tortoise. In support of this permit, we have conducted many mitigation projects throughout the County, primarily on federal lands. I and other DCP staff reviewed the subject DEIS and have the following comments that we hope will assist in your analysis.

MSHCP

On page 2-61, Table 2.9-1 appears to indicate that at a future date a permit application will be submitted to the MSHCP. If any portion of the project is to occur on non-federal lands, our MSHCP and permit may apply. If this project is addressing Endangered Species Act compliance under section 7 of that law, inclusion in our Section 10 permit may not be required, and this item should be removed from the table. 0046-1

Also, on page 1-22 and 1-23, the descriptions of the MSHCP's fee structure, conservation reserve, and mitigation strategy are not correct. Three corrections or clarifications need to be made to this section of the document. 0046-2

- There is a single $550.00 fee per acre of disturbance (take) applied under our current permit, regardless of the location of take.
- Also, the conservation reserve design uses four categories to describe areas based upon the land use designation(s) applied by the land owner/manager. Thus, these designations could be changed by the land owner/managers, and our conservation reserve design would be reviewed to determine whether additional mitigation actions are required as a result of the land use designation changes.

0046-1
Biological Resources
The FEIS text has been revised to indicate that this permit would not likleybe required because all of the disturbance related activities resulting from the Proposed Project will be contained to BLM land; therefore the Proposed Project will not disturb any land that is covered under the MSHCP.

0046-2
Biological Resources
This section was removed because all of the disturbance related activities resulting from the Proposed Project will be contained to BLM land; therefore the Proposed Project will not disturb any land that is covered under the MSHCP.

- Finally, there are no formal mitigation ratios defined within the MSHCP. Our implementation is guided by the simple goal of "no net unmitigated loss or fragmentation."

Local regulations
Other state laws may need to be added to section 1.4.2 of the DEIS, including Nevada laws related to cactus, yucca and special-status wildlife species, which are described on pages 2-37, 2-59 and 4-34. The text describing special-status plants and wildlife on page 1-22 needs to be reworded for clarity. 0046-3 0046-4

Grazing
On pages ES-7, ES-8 and 3-46 to 3-51, an analysis of the project's potential impacts to existing forage ground cover for livestock is provided. As the DEIS correctly notes, the Jean Lake and Roach Lake public land grazing allotments in or near the project area have both been closed by the Bureau of Land Management (BLM). These closures were a direct result of our program funding the purchase of the allotments, base properties and water rights from willing sellers and our program's subsequent relinquishment of the grazing privileges. 0046-5

The DEIS correctly states that the Roach Lake allotment was purchased in support of the Short Term Habitat Conservation Plan (HCP) that supported a previous Section 10(a)(1)(B) permit that was also managed by the DCP. The Jean Lake allotment was also purchased from a willing seller in the 1990s in support of the Short Term HCP. The Jean Lake allotment grazing privilege was later exchanged by DCP for another grazing privilege held by a private grazing operation. Thus, grazing continued on the Jean Lake allotment until the DCP purchased the Jean Lake allotment from a willing seller in 2005. The DCP relinquished the Jean Lake allotment grazing privileges in 2006, in support of our current permit, and the allotment was then closed by BLM. Table 3.6-2 and Section 3.6.5 of the DEIS should be updated to reflect more current information than was used in the DEIS. 0046-6

The above efforts and purchases were funded from the DCP section 10 mitigation fee funds. Thus, it is more accurate to state that these purchases were undertaken to provide mitigation for our *current and prior* permits, and that each of these purchases, relinquishments and closures provided mitigation for desert tortoise take. 0046-7

Finally, domesticated livestock grazing is not one of the natural processes in the Mojave Desert, removal of livestock grazing was recommended for desert tortoise recovery in the 1994 Recovery Plan, and the DCP has spent over a million dollars implementing this recovery measure throughout Clark County. Statements are made on pages 4-123 to 4-125 of the DEIS that imply grazing could be implemented to improve the health of the project area. These statements should be further explained and references to supporting literature provided, or these statements should be removed. 0046-8

Riparian and rare plant exclosures or enclosures
Pages ES-8, 2-70 and 4-54 to 4-55 describe potential temporary impacts of the project on riparian and rare plant fences, installed to exclude cattle from these sensitive resources. As these areas and exclosure fences are not depicted on any of the DEIS 0046-9

0046-3
Biology - Plants
Section 1.4.2 The FEIS text has been revised to incorporate the additional state laws related to yucca, cactus, and special status species.

0046-4
Biology - Plants
In section 1.4.2.5 Special Status Species State, the text has been adjusted to separate both of the following regulations

Nevada Revised Statute 501

Nevada Revised Statute 501, supplemented by the Nevada Administrative Code (NAC), is the Nevada state law that covers administration and enforcement of wildlife resources within the state. The administering agency is the NDOW. Any authorizations for impacts to protected species would be processed through the NDOW.

Nevada Revised Statute 527.060–527.120

Nevada Revised Statute 527, supplemented by the NAC, protects and regulates the removal of Christmas trees, yuccas, and cacti for commercial purposes. Such removal or possession requires a permit and tags from the Nevada Spur Forester Fire Warden, Nevada Division of Forestry.

0046-5
Grazing
These statements have been removed. Thank you for your comment.

0046-6
Grazing
These statements have been removed. Thank you for your comment.

0046-7
Grazing
Thank you for the information. We will update the text of Section 3.6.5.1 and Table 3.6-2 to reflect the information you have provided and cite your comment letter in the Final EIS.

0046-8
Grazing

These statements have been removed. Thank you for your comment.

0046-9
Biology - Plants
Because the Proposed Project would occur on Federal land, the EIS does not analyze impacts under the MSHCP. cause the Proposed Project would occur on Federal land, the EIS does not analyze impacts under the MSHCP. Currently, the Jean Lake and Roach Lake allotments are closed to grazing.

maps, it was difficult for us to assess the potential impacts to MSHCP covered species, or to understand why these fences but not the enclosed resources might be directly impacted by the project.

Desert tortoise and other wildlife
You may wish to review the USGS Desert Tortoise Habitat Model (USGS Open File Report 2009-1102, available here: http://pubs.usgs.gov/of/2009/1102/) for additional information on desert tortoise habitat components and potential habitat quality in the project area. Also, there are vertebrate habitat models available from the Southwest ReGAP project, available here: http://fws-nmcfwru.nmsu.edu/swregap/habitatreview/ .

Geologic setting 0046-10
On pages 3-13 and 3-14 "ancient intrusive and metamorphic rocks" in the Lucy Gray Mountains are described, but figure 3.3-1 on page 3-15 depicts extrusive rocks. Is this a typo?

Weeds 0046-11
On page 3-46 and page 6-7, a Clark County 2009 report is cited as a source of information for weeds in the project area. From the citation information provided on page 6-7, I am not able to determine which report you have used. It is possible that the 2009 final project report written by the National Park Service and Public Lands Institute for the Interagency Weed Sentry Project would be of assistance. A copy of this report can be found here:
http://www.accessclarkcounty.com/depts/daqem/epd/dcp/Pages/dcp_reports.aspx

Fuels and fire management 0046-12
On pages 4-123 to 4-125 of the DEIS, statements are made that implies prescribed burning or grazing would be necessary to ensure the ecological health of the project area. Yet on page 3-111 the fire frequency of the project area is described as 1 fire every 200 years, and the DEIS states "Generally, in their undisturbed condition, these desert shrub communities did not historically support spreading or intense wildfire activity." The project area does not appear to be a system adapted to frequent, mosaic-inducing wildfires. Why would prescribed burning or the application of non-native grazing animals be considered necessary for this area? The statements on pages 4-123 to 4-125 should be further explained and references to supporting literature provided, or these statements should be removed.

In addition, the risks of possible introduction and spread of weeds in portions of the project site are described on pages 4-37 to 4-40 and 4-56, as well as the potential for weed spread beyond the project site on pages 4-43 and 4-69, and on pages 3-111 to 3-112 the impact that weeds such as *Bromus* spp. have on the risk of wildfires is described. Pages 2-37 and 2-52 then discuss the minimization measures that will be taken to reduce this risk of wildfire spread – mowing of the vegetation under the solar panels to a height no greater than 12 inches. Figures 2.4-2, 2.4-4 and 2.4-6 should then depict the vegetation that is currently shown among the solar panels at a more accurate height. The vegetation currently depicted within the solar panel area in these figures is the same size and height as the vegetation outside the solar panel area, and is misleading. 0046-13

0046-10
Geologic Resources
The Lucy Gray Mountains are comprised of ancient intrusive and metamorphic rocks, including granite, granite gneiss, granitic augen gneiss, and quartz monzonite. Figure 3.3-1 on page 3-15 depicts a more general dataset but is consistent with the language on page 3-13 and the table on page 3-14.

0046-11
Biology - Plants
The citation has been revised in the text.

0046-12
Wildland Fire and Fuels Management
Thank you for your comment. We will update the text of Section 4.18.1 on page 4-123 to make our statements more clear. This information was taken from the Las Vegas Field Office Fire Management Plan (BLM 2004).

0046-13
Wildland Fire and Fuels Management
Maintenance of the firebreak is an implementation action, not a planning action. This will be discussed and depicted in project implementation plans.

Transportation and Recreation
Pages ES-12 and 4-145 state: "OHV recreational activity and races would not be allowed within these areas and new routes would be designated." Are new route designations allowable under the current Resource Management Plan and associated Biological Opinion? Would the location(s) and impacts of these new routes that would be a direct result of the project need to be analyzed in this DEIS? 0046-14

Penstemon
On page ES- 7, 4-41 and 4-142, the DEIS discusses the potential impacts of the project on the "white margin penstemon", which is also correctly named elsewhere in the document as the white-margined penstemon (*Penstemon albomarginatus*). As part of our mitigation, the DCP has also funded Nevada System of Higher Education to conduct research on the penstemon that may be of interest; it is available here: http://www.accessclarkcounty.com/depts/daqem/epd/dcp/Pages/dcp_reports.aspx 0046-15
In summary, this research found no significant sand or sediment transport over a two year period in the studied penstemon habitats in Clark or Nye Counties.

Also, on page 3-49, the phrase "Nevada BLM state-listed special status" is used to describe the species. The species is not listed by the state of Nevada, but this phrase could be confused to imply state-listing. 0046-16

On page 3-30, Table 3.6-1 and Section 3.6.3.1 do not correctly note the plants that are covered by the MSHCP. The MSHCP Section 10(a)(1)(B) incidental take permit should be consulted and these portions of the DEIS corrected. A copy of the permit is available here: 0046-17
http://www.accessclarkcounty.com/depts/daqem/epd/dcp/Pages/dcp_guidingdocs.aspx

References and literature cited in the text
On page 3-46 and page 6-7, a Clark County 2009 report is cited as a source of information for weeds in the project area. From the citation information provided on page 6-7, I am not able to determine which report you have used. It is possible that the 2009 final project report written by the National Park Service and Public Lands Institute for the Interagency Weed Sentry Project would be of assistance to you. A copy of this report can be found here: 0046-18
http://www.accessclarkcounty.com/depts/daqem/epd/dcp/Pages/dcp_reports.aspx

In the references section, item DAQEM 2009 is incorrectly attributed to a "Nevada Department of Air Quality and Environmental Management." DAQEM is a department within Clark County, not the state government.

Related projects
On page 3-57 of the DEIS, the importance to this project of Southern California Edison's proposed upgrades to their Eldorado-Ivanpah Transmission Line is mentioned. As you may be aware, the DCP has commented on this project and its potential impacts to the Boulder City Conservation Easement, which our program holds over Boulder City owned lands in the Eldorado Valley. See our letters from DCP to BLM dated June 6, July 24, and August 28, 2009 regarding the transmission line project proposal.

0046-14
Recreation
The new routes in question would be service and access roads for the proposed project, not specifically OHV designated routes. During operation, OHV recreationists would be allowed year-round access to external access roads and service roads to connect to existing OHV trails. The Proposed Project does not invove designating new OHV trails and is not in conflict with the BLM Las Vegas RMP and associated Biological Opinion.

0046-15
Biology - Plants
The 2010 spring botanical survey did not detect the presence of white-margined beardtongue in the Proposed Project site; the Proposed Project will not directly impact this species.

0046-16
Biology - Plants
The text has been revised in the FEIS.

0046-17
Biology - Plants
The MSHCP ranking of species has been removed from the FEIS because all of the disturbance related activities resulting from the Proposed Project will be contained to BLM land; therefore the Proposed Project will not disturb any land that is covered under the MSHCP.

0046-18
Biology - General
The text has been revised in the FEIS.

Again, I hope the above comments and resources assist you in the analysis of this proposed project. If you have any questions please do not hesitate to contact me.

Sincerely,

//S//

Sue Wainscott
Desert Conservation Program
Clark County
333 North Rancho, Suite 625
Las Vegas, NV 89106

cc: Carrie Ronning, BLM
Brok Armantrout, City of Boulder City
Jeri Krueger, USFWS

SOUTHERN CALIFORNIA EDISON
An EDISON INTERNATIONAL Company

May 28, 2010

Mr. Greg Helseth
Bureau of Land Management
Southern Nevada District Office
Renewable Energy Project Manager
4701 N. Torrey Pines Drive
Las Vegas, NV 89130

RE: Request for Comments on Draft Environmental Impact Statement (EIS) for the Silver State Solar Project {N-0850772800 (NVS3100)}

Dear Mr. Greg Helseth:

Southern California Edison (SCE) appreciates the opportunity to review and provide comment on the Draft Environmental Impact Statement (EIS) for the Silver State Solar Project (Project). The Project is described as a proposal to construct and operate a 400-megawatt photovoltaic solar plant and associated facilities on public lands approximately 2 miles east of Primm, in southern Clark County, Nevada.

The EIS indicates the power produced by the Project would deliver renewable energy from the Project into the California market via SCE's proposed 220kV upgrade to the existing 115kV line, known as the Eldorado-Ivanpah Transmission Project (EITP). Required interconnection facilities may include one or more 220kV structures, as well as network upgrades that could include added facilities at five existing SCE substations, extensive new 220 and 500 kV T/L facilities, and new fiber optic cable. These facilities are not described in the Project Description for this EIS. 0047-1

Silver State Solar Project applied to the California Independent System Operator (CAISO) for interconnection, and is currently negotiating the execution of the Large Generator Interconnection Agreement (LGIA) with SCE. 0047-2

Even though this project is located outside California, there is the possibility that SCE construction may have environmental consequences subject to CEQA review, as required by the California Public Utilities Commission (CPUC). If those environmental consequences are identified and addressed in the environmental process for the larger project, SCE may not be required to pursue a later, separate, mandatory environmental review through the CPUC's General Order 131-D (GO 131-D) process. If the SCE facilities are not adequately addressed in the review of the larger project and the new facilities result in significant environmental impacts, additional review could delay approval of the SCE portion of the project for two years or longer. 0047-3

0047-1
Project Description
The EIS discusses the possibility that the electrical power generated at the proposed project may be delivered to customers in California, icluding those within SCE's service area. It is understood that additional environmental and regulatory reviews would be necessry to off-take additional power generated in the region. We included the current EITP project in the cumulative impacts assessment believing that the project as currently proposed would have sufficient capacity to off take the power from the Silver State Solar project.

0047-2
Project Description
Thank you for your comment. We will include this statement in the Final EIS.

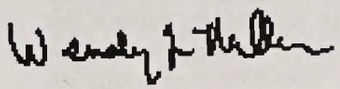
0047-3
Growth Inducing Effects
We understand the possibility that system upgrades to accomodate additional energy from outside California may require additional approvals and CEQA documentation.

0047-4

We request that, to the extent feasible, the Final EIS address the description and environmental impacts related to construction of interconnection facilities, including transmission line, distribution line, and telecommunication system. These facilities are an integral part of the overall project which should be considered part of the whole action being evaluated by the BLM.

We look forward to working closely with the Silver State Solar Project and the Bureau of Land Management to support interconnection of this project into the CAISO grid. If you have any questions regarding this letter, please do not hesitate to contact me at (626) 302-9543 or via email at wendy.miller@sce.com.

Sincerely,



Wendy Miller, Manager
Environmental Health & Safety
Southern California Edison Company

C: Charles Adamson, SCE
Beth Gaylord, SCE
Hoorik Davoudian-Telle, SCE
John Tucker, SCE
Manuel Alvarez, SCE
Thomas Burhenn, SCE
Gabrielle De Gange, SCE
Gordon Brown, CEC

0047-4
Growth Inducing Effects
The Final EIS contains a description of the environmental impacts related to construction of interconnection facilities. See resource sections in Chapter 4.

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Via facsimile 702-515-5023; and via
e-mail Nextlight_Primm_NV_SEP@blm.gov

May 31, 2010

BLM, Las Vegas Field Office
Attn: Greg Helseth
Renewable Energy Project Manager
4701 N. Torrey Pines Drive
Las Vegas, Nevada 89130

REGARDING: DRAFT ENVIRONMENTAL IMPACT STATEMENT FOR THE SILVER STATE SOLAR ENERGY PROJECT (NVN 085077)

Dear Mr. Helseth:

The comments herein address concerns related to the Draft Environmental Impact (DEIS) Statement for the Silver State Solar Energy Project (NVN 085077) and are specific to groundwater withdrawal of 21 acre feet per year (AFY) of permanent long-term supply and 600 AFY of groundwater withdrawal for construction purposes with no more that 200 AFY withdrawn in any one year. Based on analyses completed in the DEIS water resources sections, there appears to be a lack of data, analyses and results related to the effects of groundwater withdrawal on existing and adjacent water rights owners and water users. As such, comments below are specific to water resources with the intent for this missing information to be included in the Bureau of Land Managements (BLM) ongoing environmental analyses. 0048-1

Furthermore, with Primm South Real Estate Company having the vast majority of water rights permits in close proximity to the proposed project, it is important that the appropriate level of groundwater evaluation be completed for the proposed project. Based on the water resources sections in the DEIS, there appears to be missing data, analyses, results to back up the interpretations, i.e., there will be no drawdown, only local and short-term effects, or groundwater withdrawal would not adversely affect water supply or cause drawdown, etc. 0048-2

Primm South Real Estate Company is concerned that the proposed project could adversely affect their water supply wells that are within ½ mile of the proposed pumping center(s). A more complete groundwater analysis and establishment of monitoring wells

31900 Las Vegas Boulevard South • Primm, Nevada 89019 • 702.386.7867 • www.primmvalleyresorts.com

0048-1
Water Quality and Hydrology
Addressed in current draft, Section 4.5.2. and in the NextLight Silver State - Groundwater Availability Study (2009).

0048-2
Water Quality and Hydrology
The potential project effects on water supplies are described in the DEIS in section 4.5.2. as well as the NextLight Silver State - Groundwater Availability Study (2009). The Study modeled drawdown for two well scenarios, a 600 foot well and a 800 foot well. Under both simulations, representing pumping during project construction and operation, drawdown during the operation (long term) of the project was small (less than a foot at a distance of 3 miles from the well). Under an extreme peak demand scenario (continuous pumping of 550,000 gal/day during project construction), drawdown at 200 feet from the 600 foot deep well was simulated at about 19 feet; drawdown 200 feet from the 800 foot deep well was about 10 feet.

The estimated 550,000 gal/day scenario corresponds to filling water trucks periodically during a day. However, the instantaneous groundwater withdraw will be reduced by pumping groundwater to a pond. The pond will have a volume of about 2 million gallons. Were the peak demand to persist for 10 days, the demand could be satisified with a groundwater pumping rate of 240 gal/min and utilization of the storage within the pond. While such an extended demand is unlikely, it defines an upper boundary to the required groundwater-pumping capacity.

between the proposed project and Primm wells would be helpful to minimize Primm concerns.

Thank you for considering our comments.

Sincerely,

Robert E. Swadkins
Vice President of Finance
Primm Valley Resorts

Telephone: (702) 679-5454
FAX (702) 679-504
E-mail: Bswadkins@terriblescasinos.com

cc: Michael Starr, EVP & General Manager
Sean Higgins, General Counsel of Herbst Gaming

COMMENTS TO THE DEIS (NVN 085077)

Page 2-19 Figure 2.5-1 Site Map

Please show the proposed locations of the two wells: one construction well and the one permanent well.

Page 2-35, Section 2.6.6 Proposed Project Water Supply

Please clarify that the total use in any one year shall not exceed 200 acre feet as stated on Page ES-6 and in Section 4.5.2; rather than the statement "The maximum volume of construction water in any given year is not expected to exceed 200 acre feet."

Page 2-39 Section 2.6.6 septic fields

Please clarify the permitting requirement for the use of septic fields and show effects of waste system disposal on groundwater resources.

Page 3-25, Section 3.5.2 Groundwater Resources

Please expand on the source water assessment for "Whiskey Pete's Hotel and Casino…"

Note that Primm South Real Estate Company (Primm) owns Nevada Division of Water Resources (NDWR) permits to appropriate water of the State of Nevada (Nos. 50808, 51870, 51871, 51872, 51873, 52087, 52088, 52686, 52687, 63594 and 68945) and associated wells. Within ½ mile of the proposed project's construction water supply well and permanent well are four active Primm water supply wells with a quasi-municipal and power generation matter of use. There are numerous monitoring wells associated with Primm and others that do not appear to have been included in this evaluation.

Page 3-26, Section 3.5.2.2 Water Use and Discharge

Regarding the statement, "One site is sourced by effluent from the Primm Wastewater Treatment Plant and permitted for power and water storage at the adjacent NV Energy Walter M. Higgins Power Generating Station." Please revise as no Primm wells discharge effluent from the Primm Wastewater Treatment Plant.

Page 4-21 Section 4.5.2 Direct and Indirect Effects by Alternative
Effect WATER-1

Please provide the data, analyses, results, and interpretations from the "….Applicant analyzed 23 wells in the immediate vicinity of the Proposed Project to determine the required well depth and assess water supply and draw down effects."

As stated "The well analysis concluded that water consumption for the Project would not adversely affect water supply or cause draw down, with the use of temporary storage pond." Please include data, analyses, results, and interpretations to support this statement. In addition, clarify how the statement ....."... with the use of temporary storage pond" relates to not adversely affecting water supply or causing drawdown.

Please include a statement that beyond LVVWD's approval for use of their water rights that NDWR would have to approve a water rights change application for the proposed project's use.

Page 4-22 Section 4.5.2 Direct and Indirect Effects by Alternative
Effect WATER-1

The statement, "Effects to drawdown would only be a concern during peak water usage for dust suppression." This statement contradicts the statement on the previous page and listed in the comment above. Please provide the data, analyses, results and interpretations for the groundwater analysis completed.

The statement "With the temporary storage pond system described above, effects to groundwater draw down would be localized and short-term." Please explain how the temporary storage pond system can have an influence on drawdown and how this is related to being local or short-term. In addition, define local and short-term and state the criteria by which local or short-term water level or water quality changes are acceptable.

Page 4-22 Section 4.5.2 Direct and Indirect Effects by Alternative
Effect WATER-2

Missing in this section is an analysis related to excessive groundwater withdrawal and the potential to mobilize poor quality groundwater and affect existing permitted water rights. Poor quality groundwater is known in Ivanpah Valley and has been mobilized by groundwater withdrawal in the past. Please include data, analyses, results, and interpretations specific to the potential to mobilized poor quality groundwater and affect existing water rights permit owners.

The statement that "groundwater is located around 550 feet below ground surface" should be corrected.

Page 4-25 Section 4.5.2 Direct and Indirect Effects by Alternative
MM WATER-1

Please include a statement that groundwater monitoring (water levels and water quality) and a groundwater monitoring plan shall be included in pre- and post-construction documents as well as part of project operations.

Page 4-133, Section 4.19.5 Existing Cumulative Conditions

Please include LVVWD in this section.

Page 4-160, Section 4.20.1.5 Water Resources/Hydrology

Please include information that groundwater withdrawal could mobilize poor quality groundwater and influence existing water rights permit owners.

Page 2-69 Table 2.10.1

Based on revisions made to the water resources section please revise Table 2.10.1 accordingly.

From: Michele_Bilodeau@blm.gov
Sent: Tuesday, June 01, 2010 7:22 AM
To: Doyle, James Conor; Levine, Howard
Subject: Fw: Comments on Silver State Solar Project DEIS

Michele Bilodeau
Environmental Coordinator, RECO Group
BLM Southern Nevada District, Pahrump Field Office
Phone: 702.515.5136
----- Forwarded by Michele Bilodeau/LVFO/NV/BLM/DOI on 06/01/2010 07:21 AM -----

Brendan Hughes <jesusthedude@hotmail.com>

05/25/2010 08:12 PM

To <nextlight_primm_nv_sep@blm.gov>
cc
Subject Comments on Silver State Solar Project DEIS

To whom it may concern:

My name is Brendan Hughes and I would like to comment on the Silver State Solar project. I urge BLM to choose the No Action Alternative for this project. This project will have an enormous and unmitigable impact on sensitive species. First, this project could diplace 100 or more desert tortoises and destroy their habitat. This is an unacceptable loss and should not be allowed to occur. The experiment with tortoise translocation for the Ft. Irwin expansion in California has been disastrous, and the lesson should be that tortoise habitat should be retained and toroises should not be taken. Additionally, if the project does get approval, I can find no mitigation acreages in the DEIS that Nextlight will be required to purchase for destroying tortoise habitat. If the project does occur, I recommend five acres purchased and preserved for every acre of habitat disturbed for this project. If this acreage cannot be found in Nevada, then BLM should not be able to disturb any more tortoise habitat. Moreover, this project cuts off a crucial linkage for wildlife, and tortoises in particular, to the Ivanpah and Piute-Eldorado Critical Habitat Units. Any tortoises to the north of this project will not be able to get around it or the McCullough Mountains to have interactions and genetic exchange with other members of their species. 0049-1

This project will have many other severe biological impacts. The solar project will cut off a big horn sheep movement corridor. Additionnally, sensitive bat species will lose valuable foraging habitat, along with the possibility of losing torpor habitat since some bats sleep in rocks during the day. Furthermore, many other reptile and mammal species will be negatively impacted by this facility. 0049-2

This project will have unmitigable impacts to visual resources as well. Views from the North and South McCullough Mountains Wilderness Areas will be severely impacted, as will open desert vistas viewed from I-15. 0049-3

I would encourage BLM to choose the No Action Alternative for this project, which would then encourage Nextlight to place its photovoltaic panels on the rooftops of Las Vegas, where they belong.

Thank you for your consideration.

Brendan Hughes
61093 Prescott Trail
Joshua Tree, CA 92252

0049-1
Biology - Desert Tortoise
If the Proposed Project is required to mitigate acreage for the loss of desert tortoise habitat then all discussion regarding the requirement of amount/type of mitigation for the loss of desert tortoise habitat will be discussed in the Biological Opinion that will be issued by USFWS. The FEIS text regarding the analysis of impacts to desrt tortoise has been revised to incorporate your comments.

0049-2
Biological Resources
Thank you for your comments, these issue are discussed within Section 4.6.1 Indicators - Biological Resources.

0049-3
Visual Resources
Brown

Hotmail is redefining busy with tools for the New Busy. Get more from your inbox. See how.

DAQEM

DEPARTMENT OF AIR QUALITY & ENVIRONMENTAL MANAGEMENT

500 S Grand Central Parkway 1st Floor · Box 555210 · Las Vegas, NV 89155-5210
(702) 455-5942 · Fax (702) 383-9994
Lewis Wallenmeyer Director · Tina Gingras Assistant Director

June 2, 2010

Mr. Greg Helseth, Renewable Energy Project Manager
Las Vegas Field Office
Bureau of Land Management
4701 N. Torrey Pines Drive
Las Vegas, NV 89130

Draft Environmental Impact Statement for the Silver State Solar Project

Dear Mr. Helseth:

The Clark County Department of Air Quality and Environmental Management (DAQEM) has reviewed the draft environmental impact statement (DEIS), on which the Bureau of Land Management's Las Vegas Field Office is seeking comments. The DEIS considers the environmental impacts associated with granting a right-of-way on public land and subsequent construction and operation of the Silver State Solar Project. We provide the following comments for your consideration.

Included in Section 1.4.2.1, "Air Resources – Local," is a partial list of the applicable Clark County Air Quality Regulations (AQRs). Relative to the proposed project, that list should also include Sections 12, 92, and 49, at a minimum. 0052-2

Table 2.9-1, "Federal, State, and Local Permits that May Be Required for the Proposed Project," states that Section 14 contains the mandate for a New Source Review Permit. The correct AQR is Section 12; before construction begins, this project should apply for and receive a stationary source permit. The stationary source permit process is separate from the dust control permit process. From the stationary source permit application, DAQEM will determine if the project may be subject to an air quality analysis to determine compliance with National Ambient Air Quality Standards (NAAQS) and Prevention of Significant Deterioration increment requirements. The project may also be subject to the adoption of additional control technologies to satisfy permit requirements. 0052-3

Section 3.1.1.1, "Air District Significance Thresholds," states that particulate matter 10 and 2.5 microns in diameter (PM_{10}, $PM_{2.5}$) are considered a single criteria air pollutant. Although PM_{10} does at times contain a percentage of $PM_{2.5}$, they are two separate pollutants with two different NAAQS. 0052-4

BOARD OF COUNTY COMMISSIONERS
Rory Reid Chairman · Susan Brager Vice-Chairman
Larry Brown, Tom Collins, Chris Giunchigliani, Steve Sisolak, Lawrence Weekly
Virginia Valentine, PE, County Manager

0052-1
Air Quality
A review of Clark County AQRs was conducted. Based on this review, a discussion of AQR Section 12 has been added to the text. However, AQR Sections 49 and 92 were not added. AQR Section 49 is not applicable as the project would not include any boilers or steam generators. AQR Section 92 is not applicable as project activities would occur in Nevada Hydrographic Area 164B.

0052-2
Air Quality
A review of Clark County AQRs was conducted. Based on this review, a discussion of AQR Section 12 has been added to the text. However, AQR Sections 49 and 92 were not added. AQR Section 49 is not applicable as the project would not include any boilers or steam generators. AQR Section 92 is not applicable as project activities would occur in Nevada Hydrographic Area 164B.

0052-3
Air Quality
The table has been revised accordingly.

0052-4
Air Quality
The text and table have been revised accordingly.

For clarity and readability in Table 3.1-2, "State and Federal Ambient Air Quality Standards," remove the rows containing pollutants that do not have a standard or for which the standard has been revoked. The standard for lead has been revised to 0.15 $\mu g/m^3$ on a rolling three-month average. Additionally, attainment status in Clark County is determined based on the NAAQS.

0052-5

Table 3.1-5, "Exceedances of Air Quality Standards and Existing Maximum Concentrations near the Proposed Project Area," should be qualified with a statement explaining why this particular monitoring station was chosen over a monitor within Clark County.

0052-6

In Section 3.1.1.2, "General Federal Actions," the basic classification for ozone (O_3) is referenced; however, court action vacated the basic nonattainment designation in 2007, so Clark County currently has no formal O_3 classification. Additionally, a state implementation plan for O_3 has not yet been developed, although DAQEM is preparing a maintenance plan under the requirements of the 1997 O_3 standard of 80 parts per billion (ppb). The U.S. Environmental Protection Agency (EPA) promulgated a new O_3 standard of 75 ppb in March 2008; in January 2010, after further scientific review, EPA proposed a standard between 60 and 70 ppb.

0052-7

The definition for area sources in Section 3.1.1.3, "Existing Sources of Air Pollutants (Clark County 2008)," seems redundant, since fuel combustion consists primarily of hydrocarbons. The EPA definition states: "area sources consist of smaller-size facilities that release lesser quantities of toxic pollutants into the air. Area sources are defined as sources that emit less than 10 tons per year of a single air toxic, or less than 25 tons per year of a combination of air toxics. Though emissions from individual area sources are often relatively small, collectively their emissions can be of concern—particularly where large numbers of sources are located in heavily populated areas."

0052-8

Table 3.1-3, "Attainment Status for Clark County," should be augmented to include pollutant designations according to hydrographic area (HA). Although EPA has issued a finding of attainment for carbon monoxide (CO), it has not yet approved the county's CO maintenance plan and request for redesignation. Therefore, Clark County—specifically HA 212—is still designated as a serious nonattainment area for the 8-hour CO standard, as well as for the 24-hour PM_{10} standard (EPA revoked the annual standard for PM_{10} in 2006). Portions of Clark County, including all or part of HAs 164A, 164B, 165, 166, 167, 212, 213, and 214, are currently designated as nonattainment areas for the 8-hour O_3 standard.

0052-9

Chapter 4, "Environmental Consequences," should include all criteria pollutant project emissions from construction, operation, and decommissioning activities for evaluation of compliance with general conformity. Table 4.1.1, "Summary of Yearly Construction Emissions Estimates," excludes fugitive dust emissions generated during construction. This exclusion significantly understates air quality impacts: Appendix A of the DEIS (Tables 6A and 6B, "Emission Calculations") indicates 1,260 tons of fugitive PM_{10} emissions and 176 tons of fugitive $PM_{2.5}$ emissions. However, Table 4.1.1 presents only 11.4 tons of PM_{10} emissions and 11 tons of $PM_{2.5}$ emissions.

0052-5
Air Quality
The text has been revised accordingly.

0052-6
Air Quality
The text has been revised accordingly.

0052-7
Air Quality
The text has been revised accordingly.

0052-8
Air Quality
The project would occur in Hydrographic Areas 164A and 164B. These areas are designated as attainment for CO and PM10. This area is designated as nonattainment for the 8-hr ozone NAAQS. The text has been revised to clarify the location of the project in Hydrographic Areas 164A and 164B and the related NAAQs designations of this area.

0052-9
Air Quality
Chapter 4 has been revised to fully summarize air pollutant emissions from construction, operation, and decommissioning. The emissions in Table 4.1.1 have been updated to include fugitive dust. These emissions have also been updated based on a more refined examination of the equipment use assumptions and the emission factors used.

Also in Chapter 4, long-term effects on air quality could not be determined because operational emissions were not quantified to allow a determination of their significance. Although the project will have no large combustion sources on-site, proposed activities indicate other potential emission sources, including fugitive dust generated by trucks and other maintenance equipment traveling on unpaved roads. It is not clear from the DEIS whether the disturbed area occupied by the photovoltaic panels would be stabilized, and if so, to what extent. There is a potential for fugitive dust from this area which, based on the project's large acreage, could be a significant source of PM_{10}.

Finally, the Bighorn Substation mentioned throughout the DEIS was purchased by NV Energy from Reliant Energy in 2008 and renamed the Walter M. Higgins Generating Station.

We appreciate the opportunity to comment on this DEIS, and would welcome the chance to review future revisions. If you have any questions, please contact me at (702) 455-1600.

Sincerely,

Lewis Wallenmeyer
Director

0052-10

0052-10
Air Quality
Chapter 4 has been revised to fully summarize air pollutant emissions from construction, operation, and decomissioning. The emissions estimated for construction, operation, and decomissioning include fugitive dust.
The distrubed area occupied by the photovoltaic (PV) panels would not be stabilized. The PV panels are expected to reduce contact between exposed soils and prevailing winds and thus decrease fugitive dust generation as compared to existing conditions in the Project area.

(Detach and return this portion)

NAME: EDDIE LEMAIRE OR FAST EDDIE
STREET ADDRESS: PO Box 642
CITY/STATE/ZIP: GOODSPRINGS NV 89019

The BLM welcomes your comments on the Draft EIS for the Silver State Solar Project. You can detach and mail this card by putting postage on the reverse side (and checking the boxes for any publications you wish to receive). Other options for submitting your comments are listed above.

THIS SHOLD OF BEN ~~Penny~~ DON 30 YEARS AGO
ALSO EVERY HOTEL SHOULD HAVE A
ON EACH ROOF OF THEM WE HAVE,
PLANTY A WIND IN LAS VEGAS!

Thank You
EDDIE LEMAIRE
GOODSPRINGS

LAS VEGAS NV 890

From:
NAME: EDDIE LEMAIRE
STREET ADDRESS: PO Box 642
CITY/STATE/ZIP: GOODSPRINGS NV 89019

I would like to receive the following information about the project:

- O Final EIS on CD
- O Remove my name from your mailing list

My ~~email~~ address is:
ABOVE

RECEIVED
Bureau of Land Management
07:30
MAY 27 2010
LAS VEGAS FIELD OFFICE
Las Vegas, Nevada

To:
Bureau of Land Management
Las Vegas Field Office
Attn.: Greg Helseth, Renewable Energy Project Manager
4701 N. Torrey Pines Drive
Las Vegas, NV 89130

9130S2301

(Detach and return this portion)

0053-1
General
Your statement is included in the public record and will be taken into account by decision-makers when they consider the proposed project.

May 29th, 2010

To: Gregory Helseth
Las Vegas Field Office
Bureau of Land Management
Attn: Gregory Helseth
4701 North Torrey Pines Drive
Las Vegas, NV 89130–2301

Dear Greg,

We would like to submit the following comments for the Nextlight Renewable Power, LLC: Silver State Solar Project, Environmental Impact Statement.

Basin and Range Watch is a group of volunteers who live in the deserts of Nevada and California, working to stop the destruction of our desert homeland. Industrial renewable energy companies are seeking to develop millions of acres of unspoiled habitat in our region. Our goal is to identify the problems of energy sprawl and find solutions that will preserve our natural ecosystems and open spaces.

Project: The preferred project site contains up to 4,000 acres of undeveloped land. The Right of Way is substantially larger. Will it expand? Will it be 8,000 acres eventually? | 0054-1

Please clarify which technology option would be used, including photovoltaic panel and foundation. Clarify where desert vegetation would be graded/scraped, cut/mowed, or left in a natural state. Even clipping creosote bushes once will leave a danger of the shrubs stump-sprouting and shading the panels. Cutting vegetation will reduce the carbon-storing ability of the desert ecosystem, as well as disturbing the habitat for plants and wildlife. List any herbicides that will be used to keep weeds under control, and practices to prevent chemicals from entering the groundwater or leaving the site. Various digital images of the solar arrays seem to indicate vegetation will be left between the panels, such as on page 2-10 of the DEIS. Please indicate whether this is an accurate depiction. | 0054-2

Deadline for these Comments: The deadline for these comments ends on Memorial Day of 2010. The Memorial Day Weekend will not see as many comments as usual. The entire comment period is far too rushed. The DEIS admits that most of the biological surveys have not even been completed yet. BLM's attempts to rush approval of this project have compromised the quality of the DEIS. This comment deadline should be extended by two months. | 0054-3

Fast Tracking Deadlines : Due to the alarming lack of information provided in the DIES concerning desert tortoise, all biological resources, cultural resources, | 0054-4

0054-1
Project Description
The current right of way application includes 8,000 acres, but the final footprint would be smaller. The EIS addresses only a 400 MW development and no expansion is expected.

0054-2
Project Description
The technology that will be used will be solar photovoltaic. The specific type of foundation will depend on the results of geotechnical studies which will be conducted prior to construction. All likely types of foundations, including ballasts and embedded piers were analyzed in the EIS.

0054-3
General
The public comment period ended on Tuesday June 1, 2010. We believe that a 45-day public comment period was sufficient to allow all interested parties to provide comments on the Draft EIS.

0054-4
General
The number of applications for renewable energy projects on the public lands over the past 2 years has been unprecedented. The fast track process was implemented to accomodate those projects which were ripe for analysis.

0054-4
Continued

0054-4 cont'd
General
Continuation of previous comment

visual resources, reliability of the project, and storm water drainage, we believe it is unwise for the BLM to be using "fast tracking" seemingly to expedite approval of this project. We feel that it there are enough outstanding unresolved issues that make approval and construction of facilities by the end of 2010 a very unrealistic goal. We would like to request that this project be removed from the fast track list in order to provide us with more time to examine the issues. We think it is a more realistic goal for the EIS process to be extended into the year 2012, so more comprehensive biological and cultural site surveys can be conducted. Fast tracking has also created an atmosphere of distrust between agencies and the general public. Some Federal employees seem to be reluctant to share information, often acting afraid of reprimands. We have even had three federal employees confess to us that they do not want to talk about fast track renewable energy project, in fear of retaliation. One of these employees works for the Bureau of Land Management.

Alternatives: The DEIS should present the environmental impacts of the proposal and the alternatives in comparative form, thus sharply defining the issues and providing a clear basis for choice among options by the decision maker and the public. In this section agencies shall:

(a) Rigorously explore and objectively evaluate all reasonable alternatives, and for alternatives which were eliminated from detailed study, briefly discuss the reasons for their having been eliminated.

(b) Devote substantial treatment to each alternative considered in detail including the proposed action so that reviewers may evaluate their comparative merits.

(c) Include reasonable alternatives not within the jurisdiction of the lead agency.

(d) Include the alternative of no action.

(e) Identify the agency's preferred alternative or alternatives, if one or more exists, in the draft statement and identify such alternative in the final statement unless another law prohibits the expression of such a preference.

(f) Include appropriate mitigation measures not already included in the proposed action or alternatives.

The adopted 1998 Las Vegas Resource Management Plan does not include renewable energy development of geothermal, wind, and solar power; management of site type rights-of-way for renewable energy and other uses; visual resources management; land tenure adjustments to meet community growth needs; evaluation of existing and potential new Areas of Critical Environmental Concern; Off-Highway Vehicle Designation and Special Recreation Management Areas.

There is no off-site alternative in the DEIS. The BLM has informed us that they were going to cancel most of the applications by the company, Cogentrix. Many of these applications are in the region adjacent to the Nextlight proposed project. Please list these regions as proposed alternatives and fully evaluate the environmental impacts of these alternatives. 0054-5

Many alternatives are rejected due to the longer distance from transmission lines. We would like to remind the BLM that the best interest of the wildlife and ecosystems do not reflect the need of the applicant to be close to a transmission line. To simply eliminate an alternative because it would cost the applicant too much money indicates a bias from the BLM to meet only the needs of the applicant. As public land owners, we are not concerned about the needs of the applicant. Please do not eliminate alternatives based on the convenience of the applicant. 0054-6

We would like to request an alternative that designates the region an Area of Critical Environmental Concern and eliminates it from futures concern of any development in the future. 0054-7

More CO2 emissions would be released from construction and transport activities beyond the site: cement manufacture, labor travel to and from the work site, shipping, train, and truck transport of materials like heliostats from distant places such as Europe. No life cycle calculations were included in the project analysis. Any question of the benefits of a project toward reducing the effects of climate change must consider these construction impacts to the climate over the several years of building. 0054-8

Distributed generation in the built environment should be given much more full analysis, as it is a completely viable alternative. Silver State will need just as much dispatchable baseload behind it, and also does not have storage. But environmental costs are negligible with distributed generation, compared with the Silver State project. Distributed generation cannot be "done overnight," but neither can large transmission lines across hundreds of miles from remote central station plants to load centers. Most importantly, distributed generation will not reduce the natural carbon-storing ability of healthy desert ecosystems, will not disturb biological soil crusts, and will not degrade and fragment habitats of protected, sensitive, and rare species.
Alternatives should be looked at that are in load centers, not closest to the project site. There is a need to consider the "macro" picture, the entire state, to look at maximum efficiency. 0054-9

A Master comprehensive plan should exist before large expensive inefficient solar plants are sited and built out in the wildlands. This plan should carefully analyze the recreational and biodiversity resources of the Nevada desert. A list of assumptions should be included detailing the plan for integrating various fuels 0054-10

0054-5
Alternatives
Your statement is included in the public record and will be taken into account by decision-makers when they consider the proposed project.

0054-6
Alternatives
We believe that proximity to transmission lines is a valid consideration, not only from an economic feasibility standpoint, but also to mitigate potential impacts. Construction of long interconnections to possibly avoid one impact would likely result in many more impacts, including those to wildlife, visual resources, hydrology and cultural resources.

0054-7
Alternatives
The region of the project area is not currently designated as an ACEC. Immdeiately adjacent to the project area in California is the Ivanpah DWMA ACEC, however no project related activities will take place within the Ivanpah DWMA ACEC; therefore the EIS will not analyse an alternative that designates the region of the proposed project as an ACEC.

0054-8
Air Quality
Section 4 summarizes the greenhouse gas (GHG) emissions associated with the project construction activities, including emissions from delivery and worker commute vehicles. A life-cycle analysis of construction/building materials would be speculative and beyond the scope of this EIS.

0054-9
Alternatives
Distributed power generation is considered outside the scope of the purpose and need for the project; specifically, federal renewable power generation goals on the public lands.

0054-10
Purpose and Need
BLM considers rights of way applications in project level NEPA documents and not in master comprehensive plans. This is consistent with BLM policy, NEPA and CEQ guidance which allow for project level analyses of major federal actions.

mixes and technologies into each utility's plan, an overall state plan, and a national plan. Loads should be carefully analyzed to determine whether additional capacity is needed for peaking, intermediate, or baseload purposes. Unit size, which impacts capital and operating costs and unit capacity factors, has a direct bearing on the relative economics of one technology over another. A plan might recommend that smaller units built in cities and spaced in time offer a less risky solution than one large unit built immediately.

0054-10
Continued

Right now there is no utility plan, no state plan, and no national plan. Large-scale central station solar plants have been sited very far from load centers out in remote deserts, with the only criterion being nearness to existing transmission lines and natural gas lines. Very little thought has been given to the richness of biological resources, the cumulative impacts on visual scenery to tourists, the proximity to ratepayers, or the level of disturbance of the site.

The California Energy Commission says there will be a need to build many new efficient natural gas peaker or baseload plants to back up the renewables planned, and this will undoubtedly be the case in Nevada as well. Instead, the renewables should be distributed generation in load centers, which will provide much more efficiency, rather than inefficient remote central station plants that reduce biodiversity and require expensive transmission lines. This reduces the risk, as distributed generation is a known technology and has been proven in countries like Germany where incentive programs have been tested. Incentive programs can be designed in an intelligent manner to vastly increase distributed generation. Incentives for large remote projects like Silver State are unproven to lower risk and may actually raise debt levels with runaway costs associated with poor siting and higher-than-anticipated operating and maintenance costs.

Purpose and Need: There is very little logic found in the purpose and need for the project as well as the best possible management options for public lands. Many renewable project developers have failed to consider reasonable or viable alternatives that could serve as solutions that everybody could live with. In the case of this particular project, conflicts with endangered species, cultural resources, storm water drainage erosion, viewscapes from National Parks and wilderness areas could all be avoided with a distributed generation alternative. Thin film photovoltaic can be sited on developed areas using rooftops, parking lots and other urban vacant lots. The beauty of this is that there is essentially the same insolation in the city of Las Vegas, Nevada as there is in the region of the project site. The following photograph of Las Vegas from an airplane shows the endless opportunity to utilize the countless rooftops for renewable resources in the community of Las Vegas.

0054-11

0054-10 cont'd
General
BLM's respnsibilitities for this EIS was to consider the right of way application for this tract of land. Regional considerations were outside the scope of this project. The EIS did describe the impacts within the region of t his and other reasonably foreseeable projects to provide the decision maker with sufficient information to decide whether or not to approve this project or an alternative.

0054-11
Alternatives
BLM considered a reasonable range of alternatives consistent with NEPA and BLM policies and procedures. The two action alternatives satisfy the purpose and need in that they fulfill BLM's obligation to consider the ROW application, meet federal renewable energy mandates and respond to impacts identified in the NEPA analysis.

Las Vegas, Nevada, September, 2010
Endless opportunity for photovoltaic development
More megawatts could be produced from this resources than the undisturbed lands of the proposed Nextlight project.

For the Bureau of Land Management in the year 2010 to even consider taking an action that could result in the death of so many desert tortoise, reaches a new level of irresponsibility. The desert tortoise has been listed as Threatened under the Endangered Species Act since 1990. If you ask any of the desert tortoise experts how the efforts made to protect the species have succeeded, they will all give you a negative answer. The desert tortoise is not doing well. Sound management of public lands requires reasonable management decisions. Part of BLM's mission is to preserve habitat for sensitive species. The whole idea of clean energy is to be "green". Because renewable energy has a lower output compared to less clean fossil fuel sources, it needs a large footprint. In order to maintain the "green" quality of renewable energy, it is important to site these projects properly in areas that are previously disturbed. In the year 2010, if there is a healthy, disease free population of desert tortoise, you do not develop it. You preserve it. We should not have to tell this to the BLM. 0054-12

Visual Resources: The DEIS fails to adequately analyze the full impacts that this project would have on the region's visual resources. The Visual Resources section should be rewritten.

The short term construction would not only create a visual contrast from soil disturbance, but erosion from the removal of soils would compromise the visual quality of the area by allowing dust to be stirred up whenever there are wind events. The short term construction would most likely result in long term visual disturbance due to the permanent removal of desert soils.

The Key Observation Point (KOP) simulations are deceiving because they are poor quality photographs, and the angle and location of the photos were not selected from the most potentially graphic locations and angles. 0054-13

0054-12
Biology - Desert Tortoise
Your statement is included in the public record and will be taken into account by decision-makers when they consider the proposed project.

0054-13
Visual Resources
Thank you for your comment. KOP photographs were selected in consultation with BLM VRM specialists.

KOP number 1- View from Goodsprings road is a faded photograph and would be sufficient if there were three other simulations from the region. These other simulations should be sharper images with views from some closer distances to the project site.

0054-14

KOP number 2-View from I-15 near Jean is also a faded photograph that only shows a late afternoon view of the project. There should be a KOP of this view during the morning hours and at least two other KOP simulations from a closer distance to the project site from I-15.

0054-15

KOP number 4- View from Desert Oasis Apartment complex is from a low angle. An additional KOP is needed from this point that is above the large concrete wall barrier. This KOP only shows a low angle view.

0054-16

KOP number 5-View from Primm Valley Resort and Casino is good, but there need to be at least three more due to the high visitation to this resort.

0054-17

KOP number 9-View from the Entrance to the Mojave National Preserve only represents a very small percentage of the visual impacts that would occur from the park. There will need to be several other KOP simulations from the preserve including three from the Ivanpah Road.

0054-18

Night time lighting and disturbance: The DEIS fails to even address the visual impacts that would occur from security lighting and maintenance lighting. Most desert solar energy facilities usually wash their panels or mirror at night time. How much lighting would be required for this?

0054-19

How much lighting would be required for security? How bright would the lighting be? How visible would the lighting be from the Mojave National Preserve, the McCullough Mountains Wilderness Area and the Stateline Wilderness? How visible would lighting be from Primm, Nevada? Many tourists who visit the Mojave National Preserve stay at the Primm resort. Visual resources are important to these visitors. Would light be shielded to minimize glare? Are there OSHA requirements that do not allow shielding? Some solar applicants are now providing night time Key Observation Point simulations for their proposed project. We would like the applicant for this project to be required to do the same. Please provide 6 night time Key Observation Point simulations from adjacent wilderness, parks and resorts with an analysis of the projects impacts to wilderness values and star gazing.

0054-20

BLM's conclusions on all of the KOP simulations are the same: "Proposed project would attract attention, but would not dominate the view of the casual observer." By putting this statement at the conclusion of every KOP, it seems obvious that BLM did not take the time to analyze the impacts to each one individually. For example, what makes BLM think every observer is casual? The values of the

0054-21

0054-14
Visual Resources
Thank you for your comment. KOP photographs were selected in consultation with BLM VRM specialists.

0054-15
Visual Resources
Thank you for your comment. KOP photographs were selected in consultation with BLM VRM specialists.

0054-16
Visual Resources
Thank you for your comment. KOP photographs were selected in consultation with BLM VRM specialists.

0054-17
Visual Resources
Thank you for your comment. This KOP was selected as representative of views visitors to the Primm Valley Resort and Casino would see.

0054-18
Visual Resources
Thank you for your comment. This KOP was selected as reprentative of views visitors to the Mojave National Preserve would see.

0054-19
Project Design
The panels would be cleaned up to 2 times a year. No time of day has been identified.

0054-20
Visual Resources
As outlined in MM BIO-10, lighting would be directed downward, shielded, and of reduced lumen intensity and therefore would not disturb visitors to the MNP or Wilderness Areas.

0054-21
Visual Resources
Individual contrast rating forms were completed for each Key Observation Point. These are included in Appendix C of the document. The analysis included in Chapter 4 of the document summarizes this information.

visitor to Mojave National Preserve may to differ from the values of the driver who is just traveling from Las Vegas to southern California. A much more detailed analysis is needed on the impacts to visual resources.

0054-21 Continued

The region is being defined under VRM Class III visual objectives, determined to be outdated by the BLM Las Vegas Resource Management Plan. There have been wilderness areas and National Park Service areas designated sine than. This designation should not be made until the plan is updated.

0054-22

We would like to request that the BLM require the applicant to create the following additional Key Observation Point simulations:

0054-23

- At least 5 more from the Mojave National Preserve including emphasis on the Ivanpah road that crosses the New York Mountains.

- At least three from the McCullough Mountains Wilderness area

- One from the Stateline Wilderness Area

- Three more from the Primm Resort

-Two from Nipton

-Three more from Interstate 15

-Six dark sky KOP simulations from different elevations

Access and Recreation: The project area is located mostly on public lands. The proposed tidal wave of renewable projects in the region contradicts the multiple use mission of the BLM. The BLM should not designate so many thousands of acres to just energy use and transmission lines.

Greenhouse gases: The applicant's Plan of Development has indicated a need for transmission line upgrades and new transmission facilities. The green house gas called SF6 is used primarily in electricity transmission - and is emitted in especially large amounts in construction of new lines – and is 24,000 times as potent as CO2 in its global warming impacts. The Environmental Protection Agency has declared "that the electric power industry uses roughly 80% of all SF6 produced worldwide". Ideally, none of this gas would be emitted into the atmosphere. In reality significant leaks occur from aging equipment, and gas losses occur during equipment maintenance and servicing. With a global warming potential 23,900 times greater than CO2 and an atmospheric life of 3,200, one pound of SF6 has the same global warming impact of 11 tons of CO2. In 2002, U.S. SF6 emissions from the electric power industry were estimated to be 14.9 Tg CO2 Eq. ...
http://www.epa.gov/electricpower-sf6/basic.html

0054-24

0054-21 cont'd
Visual Resources
The detailed analysis of impacts to visual resources is included in Appendix C - Visual Resource Contrast Rating Forms.

0054-22
Visual Resources
This analysis considers all land use designations and visual resource management designations from applicable, adopted plans. Draft plans are not used as they have not been publicly reviewed and finalized.

0054-23
Visual Resources
Thank you for your comment. KOP photographs were selected in consultation with BLM VRM specialists.

0054-24
Air Quality
As SF6 would be a component of circuit breakers used for the project, Section 3 has been revised to include a discussion of SF6 and Section 4 has been revised to include a summary of potential SF6 emissions.

Please provide a detailed analysis of the amount of SF6 gases that would be released by this project.

0054-25

0054-25
Air Quality
Chapter 4 has been revised to include a summary of the potential SF6 emissions from project electrical equipment. Calculations of SF6 emissions are included in the appendicies.

Carbon sink: Scientific studies have revealed that desert ecosystems and minerals have the ability to store C02 gases. Have Desert Researchers Discovered a Hidden Loop in the Carbon Cycle? Richard Stone: Science 13 June 2008: Vol. 320. no. 5882, pp. 1409 - 1410 DOI: 10.1126/science.320.5882.1409

How much C02 storage capability would be replaced by development? If the goal is indeed to reduce greenhouse gases, is it wise to remove this much carbon storing living crust? Please provide a detailed analysis on the amount of GHG that would otherwise be offset by an intact arid ecosystem.

0054-26

0054-26
Air Quality
The capability of a desert ecosystem to strore C02 has not been firmly established. Further, there is no data to suggest that the project would interfere with the current mechanisms of CO2 flux in the desert ecosystem.

Weed Removal and Control: What herbicides would be used to remove vegetation from under the solar panels? How will these toxins be prevented from getting into the ground and ground water? What effects, short term and long term would the use of these chemicals have on public health? Will local land owners be at risk? How will these herbicides affect sensitive wildlife and plants? Hundreds of miles of small roads will be constructed. That has the potential to create a serious weed problem in the area. Herbicide Use Proposals and Weed Management Plans need to be developed now.

0054-27

0054-27
Hazardous Materials
The Applicant will be required to devise a Weed Control Plan prior to issuing an ROW grant. The Applicant will be required to use BLM-approved herbicides for weed control.

Vegetation Removal: How will vegetation be removed? Will it be bladed by large scrapers? How will vegetation be kept off of the site? Will any vegetation be left growing near the panels?

0054-28

0054-28
Biology - Plants
Vegetation would not be removed from the Proposed Project site until the onset of construction of a given phase. Except for cactus and yucca species protected by Nevada state law, all cleared vegetation would be mulched or composted and retained on site to assist in erosion control and limit waste disposal. In some areas to be graded outside of the solar field, native vegetation would possibly be harvested for replanting to augment soil stabilization. Otherwise, vegetation would be would be mowed using a conventional "bush-hog" to a height of 6 to 12 inches within the solar field area and areas identified for structures and transmission lines.

Water: Exactly how much water will be needed to build this project? Please give an accurate number of acre feet. Where will this water come from? How much water will be needed to wash off the panels. Solar developers consistently tell inaccurate accounts on the amount of washing that will be necessary. Blowing dust requires the concentrated thermal unit at Kramer Junction to wash their mirrors every week. Please list the amount of acre feet for panel washing. Will water softeners be used to prevent spotting? What chemicals are in the softeners? Will they be hazardous to public health and wildlife? Will they compact soils? Would Off Highway Vehicle Use create more dust thus creating a need for more panel washing water?

0054-29

0054-30

Storm Water Drainage: Berms will be subject to erosion from floods. Will soil cement be used to stabilize berms? How does the applicant propose to maintain the project if flood channels jump their banks and cross over to new channels on the alluvial fan? We have seen this occur over time in the desert. The majority of flow could change course and move down a new part of the fan, damaging panels and facilities. Where will rock be mined on site for berm reinforcement, and how many acres of surface disturbance will be involved? The applicant should develop a detailed erosion and sedimentation control plan, and a flood risk control plan now for public review. Proposed project

0054-31

Vegetation would be cleared from roadways, access ways, and where concrete foundations would be used for inverter equipment, substations, and the O&M facilities. Vegetation would be cleared for construction of the drainage controls, including berms. Organic matter would be mulched and redistributed within the construction area (except in trenches and under equipment foundations). Plant root systems would be left in place, except where grading and trenching would be required for placement of solar module foundations, underground electric lines, inverter and transformer pads, road and access ways, and other facilities to provide soil stability.

0054-29
Water Quality and Hydrology
Under the terms of the water services agreement with the Las Vegas Valley Water District, the Proposed Project would be allowed to use no more than 200 afy during the 3-4 year construction period and a total of 600 acre-feet and no more than 21 afy during project operations. To provide water for construction and operation of the Proposed Project, two on-site wells would be drilled to a depth of approximately 600 feet using a truck-mounted drilling rig (see Section 2.6.2, Construction Tasks for the Proposed Project, for a discussion of drilling techniques). The wells would be drilled in the Ivanpah Valley North Hydrographic Basin (No. 164A). Construction water demands will also be met by constructing a 2 million gallon temporary storage pond, which can be used to fill water trucks and reduce the spontaneous demand on the well.

The project would obtain water service (rights) from the Las Vegas Valley Water District, which currently has water available to meet the project's demands. However, if at any time the District or NDEP feels that its customers are being compromised, the project will be required to recharge the aquipher at a rate of 270 afy for the continued life of the project. Under the terms of the Water Service Agreement, the project wells will be metered and the project will be required to submit monthly water use reports to the District. The District will also have access to the wells for meter reading, water quality, and water level sampling.

Water rights for the project will be reviewed by the State Engineer prior to being issued in order to determine if there is sufficient groudwater for the life of the project.

0054-30
Project Description
The application of herbicides for weed control would be conducted in accordance with the manufacture's specifications and guidelines for use to minimize the potential for pesticides to reach groundwater. The applicant would prepare and implement an emergency response plan (construction phase) and Spill Prevention, Control, and Countermeasures Plan (operation phase) for hazardous material spill prevention and clean-up measures. In addition, the Las Valley Valley Water District would require monitoring of the project wells and have access to test the wells as needed to ensure groundwater quality is not impacted by the project.

0054-31

Water Quality and Hydrology

The berms would be constructed in line with the existing flow direction and along the boundaries of four natural flood corridors - each comprised of multiple washes. Should a wash within a flood corridor change direction, the berm will guide it back into the existing flow path. The berms will be lined with riprap to minimize scour and will be designed to contain the 100-year flood event. They will be inspected for performance and maintained on a regular basis including after flood events.

sites are often located on an alluvial fan that acts as an "active stormwater conveyance" between mountains and valleys. Widespread bajada flooding events and sheetwash deposition occurs. The consequences of allowing flooding through the project would be too great. Looking at the quiet desert landscape it can be easy to underestimate the violence of a summer thunderstorm or El Nino winter flood. We have witnessed storm cells in Death Valley cause huge flash floods that have moved car-sized boulders down mountain canyons and destroy small buildings. The 2004 flood in Furnace Creek Wash dug out a new channel, took out the highway, and unfortunately caused the deaths of a few tourists who attempted to drive through the water loaded with moving boulders. Even floods that do not move large debris can damage structures over time with the slow build-up of land, gravel, stones, and logs, against fences, bending them down. Recent paleoclimatological studies measuring high stands of lakes in desert playas and flows in desert rivers, such as the Verde in Arizona, have shown that the "statistics if extreme flows derived from twentieth century records are not representative of all hundred-year episodes of the past 1,400 years,...information of value for engineering applications as well as ecological understanding" (Redmond, Kelly T. 2009. Historic climate variability in the Mojave Desert. In, The Mojave Desert: Ecosystem Processes and Sustainability. Edited by Robert H. Webb, Lynn F. Fenstermaker, Jill S. Heaton, Debra L. Hughson, Eric V. McDonald, and David M. Miller. University of Nevada Press: Reno and Las Vegas.).

0054-31 Continued

This is critical: in our lifetimes we may not have even seen the largest flood events that could occur in the desert. Historical records of rain in Ivanpah Valley cannot be used as predictors of future weather.

Projects should have plans for public review that address flood concerns Including the potential high costs of repairing and maintaining facilities.

0054-32

Thin Film Solar and Cadmium: There are several references that have raised issues of concern with cadmium telluride primarily due to the risk of broken equipment releasing this heavy metal:
http://earth2tech.com/2008/09/25/cadmium-the-dark-side-of-thin-film/

Our concern is that nobody has really attempted to think about this. If the panels do degrade or erode from potential damage such as storm water flooding or sand abrasion over the next decade, will cadmium be released and if so, how would that effect public health, water quality and wildlife resources?
We would like to request that the issue be fully examined in the final EIS.

0054-33

Cultural Resources: The DEIS fails to adequately describe the cultural resources on the site. What will happen to artifacts? Will they be destroyed during construction? Geoglyphs, old trails, other features, and artifacts should be avoided, and not collected or destroyed by grading for renewable energy projects. Areas with important cultural values should be avoided.

0054-34

0054-31 cont'd
Water Quality and Hydrology
Project features, including the berms, would be designed to accommondate a 100-year flood event based on historical flood data. The magnitude and frequency of future flood events cannot be accurately predicted and could exceed the historical records in any given year. It is not feasible to construct infrastructure to withstand extreme geologic events. Any project structures which may be damaged by flooding will be assessed and repaired as practical.

0054-32
Water Quality and Hydrology
Noted. Flooding described in the DEIS, Section 4.5.2.

0054-33
Hazardous Materials
See operation and maintenance section of Effect HAZ-1. A discussion on cadmium has been added to this section of the EIS.

0054-34
Cultural Resources
The DEIS discusses cultural resources in the project APE with the level of discussion the BLM deemed appropriate for public view. Detailed cultural resources descriptions are documented in the 2009 confidential cultural resources report prepared by Statistical Research, Inc., entitled: Knocking Rocks on Lucy Gray's Alluvial Fan Class III Cultural Resources Inventory of the Silver State Solar Project, Clark County, Nevada. This confidential report is on file at the BLM Las Vegas Field Office. A thorough assessment of impacts to cultural resources was conducted by Statistical Research, Inc., in coordination with the BLM and Ecology & Environment; the BLM determined the appropriate mitigation to avoid affects to significant cultural resources.

Just because large numbers of lithics have not been found on the fan does not mean it is not a significant cultural area, as people may have used it commonly to hunt lizards and rabbits, collect *Lycium* berries, which grow commonly on many project sites, and other uses which do not preserve well in the archaeological record. 0054-35

Native American Tribal Concerns: What are the concerns of local tribes? We would like a detailed description of all local Native American Tribal concerns about renewable energy projects. An open line of communication will have to be maintained with the tribes who hold a special interest on this land. 0054-36

Biological Resources: Surveys for burrowing owl, birds, golden eagle (including helicopter surveys for nests in a 10 mile radius), and bighorn sheep should be undertaken before construction begins. Mitigation for any rare or sensitive species cannot be done without adequate baseline information. 0054-37

Closure and decommissioning activities absolutely need to include regrading of original contours and revegetation of disturbed areas with native plants. A Site Rehabilitation Plan needs to be developed now for public review. 0054-38

A detailed translocation plans should be available well before clearance activities begin, including locations of recipient and control sites. 0054-39

Before construction can begin, Jurisdictional Determination of waters in the project site, and any permits, should be obtained from US Army Corps of Engineers. 0054-40

Rare Plants: Fall surveys should be carried out in for summer-rain germinating species, and thus several plant types may have been missed or under-represented in spring surveys. 0054-41

There are no known techniques to mitigate for the loss of rare plants and their habitat in desert environments. Avoidance is the only mitigation that is appropriate for most sites. There is no known method to compensate for the loss of rare plant habitat. Simple habitat acquisition for the desert tortoise cannot provide adequate compensation for the loss of this high quality rare plant habitat. To be able to find comparable compensation habitat for the rare plants will require an enormous amount of fieldwork to survey private lands that might be occupied. Simple translocation of the adult plants does not perpetuate population structures for long-term productivity and is an unproven mitigation for habitat destruction. The scale of destruction of subsurface ecosystem components and seed banks is impossible to mitigate. 0054-42

If projects are approved, a land compensation ratio should be at least 5:1, especially in light of the massive push for energy development in the desert and the projected cumulative effect generated from similar projects. 0054-43

0054-35
Cultural Resources
Consultation letters were sent out to six tribes that included the Chemehuevi Tribe, the Colorado River Indian Tribes, Fort Mojave Indian Tribe, Las Vegas Paiute Tribe, Moapa Band of Paiutes, and the Pahrump Paiute Tribe, to inform them of the Proposed Project; and additional correspondence was sent informing them of the public scoping meetings they could attend. The letters and ensuing conversations between the BLM and the tribes resulted in a field meeting to look over some of the previously recorded prehistoric sites within the Proposed Project site. This meeting took place on October 13, 2009, and included members of both the Chemehuevi Indian Tribe and the Moapa Band of Paiutes, BLM staff, and Statistical Research, Inc. representatives that archaeologically inventoried the Proposed Project area.

0054-36
Cultural Resources
See Comment 0054-35 response for consultation efforts between the BLM and Native American tribes. The project is located on BLM lands; the BLM may provide information regarding Native American concerns regarding renewable energy projects on BLM lands. Another resource by the US Department of Energy, entitled: Using Renewable Energy on Native American Lands, can be reviewed via:
http://apps1.eere.energy.gov/tribalenergy/report_native_lands.cfm

0054-37
Biology - General
Thank you for your comment. Species specific species were not conducted, rather each of the special status species that you identified were assumed to be present within the Prposed Project area and specific mitigation measures were developed to reduce/minimize the impacts to sensitive wildlife species.

0054-38
Mitigation
A decomissioning plan will be developed as the project nears the end of its operational life (50 years) and will be made public for all interested parties to review and provide comment.

0054-39
Biology - Desert Tortoise
Details regarding the translocation site will be addressed by the Biological Opinion that will be issued by USFWS.

0054-40

Water Quality and Hydrology
Addressed in the DEIS, Section 4.5.2.

0054-41
Biology - Plants
Chapter 3 section 3.6.3.1 Plants has been updated with new plant species information.

0054-42
Biology - Plants
Text has been revised to include the results of the 2010 Botanical Report. No special status plant species were observed on the Proposed Project site. Death Valley ephedra (Ephedra funereal) was observed on the Proposed Project site. This plant is listed on the Nevada Natural Heritage Project's Watch list.

0054-43
Mitigation
Land compensation mitigation will be consistent with US Fish and Wildlife Service guidance and requirements.

0054-44

We oppose transplantation. Even if avoidance for any rare plants could be achieved, this plan still allows the habitat of these species to be carved up and fragmented, creating islands of habitat isolated from other populations and potentially even pollinators due to the heat created by the project's sun-reflecting and concentrating design. This does not provide adequate minimization to the severe impacts to these populations.

0054-45

Rare Plant Communities: Rare plant communities should be considered.

In A Manual of California Vegetation, second edition, by John O. Sawyer, Todd Keeler-Wolf, and Julie M. Evens, 2008, California Native Plant Society and California Department of Fish and Game, the authors say that for the *Larrea tridentata-Ambrosia dumosa* Shrubland Alliance (Creosote bush-white burr sage scrub): "The presence of several non-native plants, particularly *Brassica tournefortii, Bromus* spp., and *Schismus* spp., has greatly increased fire frequencies and led to the degradation and destruction of many hectares of this alliance. Long-term, intensive grazing, OHV activity, mining, and military operations have also left their mark.... We need to identify, monitor, and manage areas free of these degrading influences" (page 568).

0054-46

Many project sites are just such a large intact area of creosote-bursage scrub that are relatively free of weeds, have only light (and easily reversible) grazing, almost no off-roading except on designated tracks, and no other development disturbance. We recommend these areas be preserved and protected.

0054-47

In addition, the authors state that such associations with *Pleuraphis rigida* (Big galleta grass), and "those with a diverse shrub layer are G1 S1" (page 566). The G1 S1 (Global 1 State 1) status rank means the plant community is rare and has "fewer than 6 viable occurrences worldwide/statewide, and/or up to 518 hectares" (page 45). The NextLight Silver State sites plant community has galleta grass and a diverse shrub layer and is worthy of more studies to determine its status.

Desert Tortoise (*Gopherus agassizii*):

As the BLM is very aware, the proposed project site lies on some of the highest quality desert tortoise habitat left in the range of the Federally Threatened Mojave Population. The project site is within four miles of designated Critical Habitat for the species and was at one point proposed to be included in the Piute-El Dorado Desert Wildlife Management Area (DWMA) /Critical Habitat. The CHM2Hill biological survey report states that there may be up to 50 desert tortoise per square mile. The population estimates are based on "old calibration values for over 1000 transects conducted by Stephen Boland and Mercy Vaughn throughout the west and east Mojave Desert between 1990 through the present.".

0054-44
Mitigation
Your statement is included in the public record and will be taken into account by decision-makers when they consider the proposed project.

0054-45
Biology - Plants
Your statement is included in the public record and will be taken into account by decision-makers when they consider the proposed project.

0054-46
Biology - Plants
Your statement is included in the public record and will be taken into account by decision-makers when they consider the proposed project.

0054-47
Biology - Plants
The FEIS text has been revised to incorporate the results of the April 2010 botanical inventory which surveyed the Proposed Project area for all special status plant species.

These estimates are only based on presence/absence surveys and are possible underestimates.

0054-48

We would like to see another population estimate. Was the population estimate used to make this report the standard protocol required by the Fish and Wildlife Service? There was very little detail about this and other concerns covered in the Sundance Biological Survey report. We would like to see more information from Sundance Biological Consulting including all field data survey sheets.

0054-49

The Sundance Biological Survey Report describes the tortoise population of the site as "moderate density habitat" instead of high density yet admits that all surveys were only presence/absence surveys. How can the biologists come to this conclusion when they admit they did not conduct all of the full protocol level surveys? The 1994 US Fish and Wildlife Service Desert Tortoise (Mojave Population) Recovery Plan states that a suitable population for a Desert Tortoise Recover Unit of Desert Wildlife Management Area would be a minimum of ten adult desert tortoise per square mile. The population on the proposed project site has up to five times the density of the minimum requirements according to the applicant's biologist.

0054-50

The DEIS does not give evidence of survey methods that would estimate density values. Only presence-absence surveys were undertaken in the Presence/Absence Survey for the Desert Tortoise, on the proposed Silver State Solar Project in Ivanpah Valley, Clark County, Nevada, October 2009 CH2M Hill report. Until line-distance sampling or mark-recapture surveys are done on site, no estimates of population density should be made. This habitat could have more than the estimates in the CH2M Hill report, done using a method developed by Sundance Biology that is based on old calibration transects. Due to changing conditions of the environment and range-wide tortoise declines, calibration transects should be current. We believe that more surveys will need to be conducted to get a more accurate estimate of population density, such as mark-recapture or line-distance sampling. We would like to request surveys be conducted yearly to the fall of 2012.

0054-51

The biological report also states: "The proposed Silver State Solar Project would have both direct and indirect impacts on desert tortoises on the site and tortoises in the area. Since tortoises use the site, indirect impacts would occur through loss of habitat. Direct impacts could occur during construction if a tortoise wanders onto the site and is either injured or killed."

The proposed site lies within the Northeastern Recovery Unit for the Desert Tortoise. This population is genetically unique and qualifies as an Evolutionary Significant Unit. Recent genetic studies by Murphy et al.,2007 have concluded that tortoise populations from the Northeastern Mojave Recovery Unit are unique. The proposed ISEGS project would be constructed within the Northeastern

0054-48
Biology - Desert Tortoise
Thank you for you comment. The protocol for estimating desert tortoise population estimates was approved by USFWS and BLM. All desert tortoise data that was collected has been reviewed by BLM and USFWS.

0054-49
Biology - Desert Tortoise
Your statement is included in the public record and will be taken into account by decision-makers when they consider the proposed project.

0054-50
Biology - Desert Tortoise
Thank you for you comment. The protocol for estimating desert tortoise population estimates was approved by USFWS and BLM.

0054-51
Biology - Desert Tortoise
Your statement is included in the public record and will be taken into account by decision-makers when they consider the proposed project.

Mojave Recovery Unit, one of six designated evolutionarily significant units within the range of the Desert tortoise. This population is genetically the most distinctive unit of the desert tortoise in the Mojave Desert. When the 1994 recovery plan was issued, some of the highest known tortoise densities were in southern Ivanpah Valley, with 200 to 250 adults per square mile (US Fish and Wildlife Service 1994, Desert Tortoise {Mojave Population} Recovery Plan. Portland Oregon). We believe that the project, combined with future proposed projects, would also significantly affect a genetically distinct subpopulation of desert tortoise within the Northeastern Mojave Recovery Unit that occurs in the Ivanpah Valley. Eastern Ivanpah Valley should be protected and included in a Desert tortoise Recovery Area, specifically the high-quality habitat where the NextLight Silver State South and North are proposed. This may have some of the highest densities in the Mojave Desert, based on our preliminary surveys, with healthy populations isolated from disturbance and fragmentation. This area should be included in the Piute-Eldorado ACEC and managed for tortoise recovery, not developed as a solar energy zone. The Northeastern Mojave Recovery Unit, one of six designated evolutionarily significant units within the range of the Desert tortoise. When the 1994 recovery plan was issued, some of the highest known tortoise densities were in southern Ivanpah Valley, with 200 to 250 adults per square mile (US Fish and Wildlife Service 1994, Desert Tortoise {Mojave Population} Recovery Plan. Portland Oregon). Densities for the northern Ivanpah Valley in the 1990s were typically less than 50 adults per square mile (ibid.). Ivanpah Valley area is considered excellent quality tortoise habitat with some of the highest population densities in the East Mojave.

Translocation plan: In a recent conversation with the Las Vegas District BLM biologist, It has come to our attention that the plan is to move or "translocate" over 200 (possibly more due to the difficulty of evaluating juvenile populations) desert tortoise to a site 25 miles to the south in the vicinity of the Walking Box Ranch. This has changed from the first plan to translocate them all to an area by highway 93 north of Searchlight. From the information we were able to get, it appears that the translocation site may be as much as 800 feet higher in elevation. We were also told that this site is not even been fully evaluated and it is not known if it would be suitable as a translocation site. It would appear that BLM and the applicant are having considerable trouble locating a suitable site to move 200 Federally Threatened desert tortoise to.

0054-52

Translocation is more experimental than a proven method and often has disastrous results. In 1997, the Clark County Large Scale Translocation Site was established along the bajada almost directly across the Interstate from the proposed project site. It was very difficult to get an exact number of how many desert tortoise were moved to this site. We do know it was in the thousands. We also know that the people in charge who worked for the county were involved in controversy for exceeding the allowed limit of translocated animals. All one has to do now is walk up any of the canyons that are directly above the translocation site and one will find that there are countless carcasses of desert tortoise that did

0054-53
0054-54

0054-52
Biology - Desert Tortoise
The relocation site and translocation have bee identified. The sites have been properly surveyed to determine tortoise densities for each site. The Biological Opinion that will be issued by the USFWS will outline the exact details of the relocation/translocation plan.

0054-53
Biology - Desert Tortoise
Your statement is included in the public record and will be taken into account by decision-makers when they consider the proposed project.

0054-54
Biology - Desert Tortoise
Your statement is included in the public record and will be taken into account by decision-makers when they consider the proposed project.

not survive this experiment.

Tortoise Carcass, Bird Springs Range, Clark County, Nevada, 2008

In 2008, over 40 percent of translocated desert tortoise died from drought and predation as a result of the disastrous Ft. Irwin Desert Tortoise Translocation Project. The first phase of the translocation was begun in March 2008, when about 770 tortoises were moved from Fort Irwin to areas south of the installation that already had desert tortoise populations. Almost immediately, coyotes began killing both relocated and resident desert tortoises. This resulted in an effort to exterminate natural predators from the ecosystem in an attempt to make the project more successful. | 0054-55

Dr. Kristin Berry, of US Geological Survey-Biological Resources Division, said Fort Irwin expansion translocations resulted in a large mortality. Spring 2008 translocation at her plots of 158 tortoises resulted in 65 known still alive as of April 2010. Coyotes and ravens were a problem predating tortoises on both recipient sites and control sites, as well as on nearby study areas. Two tortoises were run over on roads. Berry concluded translocation is a very risky endeavor. (California Energy Commission workshop May 3, 2010, for Ridgecrest Solar Power Project).

Desert Tortoise are long lived, slow adapting animals. They do not adapt to | 0054-56

0054-55
Biology - Desert Tortoise
The final relocation/translocation plan will be outlined in the Biological Opinion that will be issued by USFWS. This plan will follow USFWS's May 2010 Translocation of Desert tortoises (Mojave Population) from Project Sites: Plan Development Guidance and will address the following issues: selection of the translocation site; selection of a control site (if five or more tortoises are to be translocated); determination of the health of tortoises (translocatees and residents); methods to be used during the translocation process; and post-translocation monitoring (minimum 5-years) of the translocated individuals. Only healthy tortoises, as determined by the results of a health assessment of each tortoise, will be translocated. Additionally, the translocation site will be located within the same habitat type and consists of a desert tortoise population of similar size and structure (genetic included) as the Project Site. To determine the success of the translocation of the tortoises, a control site of similar size, habitat, and desert tortoise population to that of the relocation site will be monitored and compared to.

0054-56
Hazardous Materials
Your statement is included in the public record and will be taken into account by decision-makers when they consider the proposed project.

change very well. Translocation was not meant to be used on such a wholesale scale. It was developed as a mitigation measure for much smaller development project. At a recent workshop held in Ridgecrest, California concerning a proposed solar energy project of a different design which also has a significant desert tortoise population, there was a very long debate on translocation. Solar Millennium, the project applicant, has hired Dr. Alice Karl to oversee the tortoise surveys and relocation of desert tortoise. Dr. Karl has been hired to oversee many translocation projects. She stated that even under the best conditions using the most qualified biologists, some tortoises will die when they are translocated.

0054-56 Continued

Section 7(a)(2) of the ESA requires federal agencies to "insure that any action authorized, funded, or carried out by such agency . . . is not likely to jeopardize the continued existence of any endangered species or threatened species or result in the adverse modification of habitat of such species . . . determined . . . to be critical . . .." 16 U.S.C. § 1536(a)(2); 50 C.F.R. § 402.14(a). To accomplish this goal, agencies must consult with the FWS whenever their actions "may affect" a listed species. 16 U.S.C. § 1536(a)(2); 50 C.F.R. § 402.14(a). Section 7 consultation is required for "any action [that] may affect listed species or critical habitat."

0054-57

50 C.F.R. § 402.14. Agency "action" is defined in the ESA's implementing regulations to "mean all activities or programs of any kind authorized, funded, or carried out, in whole or in part, by Federal agencies in the United States...." 50 C.F.R. § 402.02.

We would like to see the translocation plan, and we would specifically like to review the monitoring plans for the tortoises that will be moved.

0054-58

Health status: What is the health status of this population? Were any symptoms of Upper Respiratory Tract Disease detected? If so, was this just a visual survey?

Cutaneous dyskeratosis is a shell disease that has unknown implications on desert tortoise populations. In advanced cases, exposed areas become infected with bacteria, fungus, and exposed tissue and bone may become necrotic (Homer et al. 1998, Homer et al. 2001). Cutaneous dyskeratosis was initially identified on the Chuckwalla Bench Desert Wildlife Management Area, Riverside County, California, USA (Jacobson 1994). Hypotheses for the cause of the disease include auto-immune diseases, exposure to toxic chemicals (possibly from mines, or air pollution), or a deficiency disease (possibly resulting from tortoises consuming low-quality invasive plant species instead of high-nutrient native plants) (Jacobson et al. 1994, USFWS 2008). We are concerned that destructive events such as flash flooding will release cadmium telluride into the ecosystem, thus having the potential to intensify this problem. We would like to request a study on the impacts of heavy metals and other toxins potentially released by the proposed project would have on desert tortoise populations relating to the disease cutaneous dyskeratosis. The project applicant proposes to use thousands of thin film panels which contain the heavy metal cadmium

0054-59

0054-60

0054-56 cont'd
Hazardous Materials
Your statement is included in the public record and will be taken into account by decision-makers when they consider the proposed project.

0054-57
Recreation
Consultation with USFWS has been initiated and is on going. USFWS will issue a Biological Opinion that will address the potential impacts to species protected under the ESA that would result from the construction and operation of this Proposed Project. The Proposed Project will not be allowed to start construction until USFWS has issued the Biological Opinion. And if USFWS deemed the project would be detrimental to the survival of the species, then a Jeapordy Letter would be issued rather than the Biological Opinion.

0054-58
Biology - Desert Tortoise
The final relocation/translocation plan will be outlined in the Biological Opinion that will be issued by USFWS. This plan will follow USFWS's May 2010 Translocation of Desert tortoises (Mojave Population) from Project Sites: Plan Development Guidance and will address the following issues: selection of the translocation site; selection of a control site (if five or more tortoises are to be translocated); determination of the health of tortoises (translocatees and residents); methods to be used during the translocation process; and post-translocation monitoring (minimum 5-years) of the translocated individuals. Only healthy tortoises, as determined by the results of a health assessment of each tortoise, will be translocated. Additionally, the translocation site will be located within the same habitat type and consists of a desert tortoise population of similar size and structure (genetic included) as the Project Site. To determine the success of the translocation of the tortoises, a control site of similar size, habitat, and desert tortoise population to that of the relocation site will be monitored and compared to.

0054-59
Mitigation
Your statement is included in the public record and will be taken into account by decision-makers when they consider the proposed project.

0054-60

Biology - Desert Tortoise
Your statement is included in the public record and will be taken into account by decision-makers when they consider the proposed project.

telluride for this project. There is absolutely no information on the durability of panels, what would happen if flood or seismic events break panels and cadmium is released into the ecosystem. Would there be impacts to desert tortoise from exposure to this heavy metal?

Re-routing Off Highway Vehicle Trails: Although not explained in the DEIS, BLM employees told us at a public meeting the an Off Highway Vehicle trail will be re-routed to an area north and east of the project. Is this true? If so, why is it not in the DEIS? Re-routing this trail would move a well used route into a sensitive desert tortoise area. Why would BLM approve this Right of Way for a large multi-thousand acre energy development in prime desert tortoise habitat and than re-route a trail for vehicles in the remaining habitat that is not developed? This would encourage OHV trespass in washes and new areas that were previously undisturbed. OHV use also encourages the spread of invasive weeds into desert tortoise habitat. The proposed site is now surprisingly weed free. Why did BLM not come up with a mitigation proposal that eliminates all OHV's from the area surrounding the project site?

Connectivity: How would the cumulative impacts from this project effect the overall connectivity of the Northeast Mojave Recovery Unit? If the entire Ivanpah Valley is developed for renewable energy projects, will there be any connectivity available for this population? The Sundance Biological Report states that a radio transmittered tortoise from another area and past study was found on the project site. That would be direct evidence of connectivity. How will this be mitigated? We would like to remind BLM that protection of the tortoise does extend outside of just critical habitat or DWMA's. Many proposed project sites are located in topographically favorable regions with excellent habitat. These regions are important to maintain as undeveloped because they provides connectivity between and within recovery units of the desert tortoise.

Mitigation: What mitigation measures will be taken? BLM requires a one to one mitigation. We request that the applicant be required to buy a 5 to one amount of acreage of tortoise habitat as in the project site. This habitat should be in the same genetic recovery area as the project site. For example, it would not be appropriate to purchase land in a different Recovery Unit to offset this project. Mitigation land should also include connectivity corridors between recovery units as is the proposed project site.

Mitigation land for desert tortoise should not overlap with different species of rare plants, burrowing owls and other sensitive species. Other species often have different ecological requirements so it is important not to undermine their needs by lumping all species needs to one category.

This information should be provided by applicants:

1. Copies of all desert tortoise pre-project survey data sheets.

2. Resumes of surveyors.

3. Indicate the personnel that had a minimum of 60 days prior field experience searching for desert tortoises and tortoise sign.

4. For surveyors without 60 days prior field experience, provide a discussion of how surveyors were trained and any measures that were taken to ensure they obtained accurate survey results.

5. Dates and times of tortoise surveys. If surveys were not conducted during appropriate seasons (April through May and September through October) as determined by U.S. Fish and Wildlife Service (USFWS) April 2009 Pre-Project Field Survey Protocol (http://www.fws.gov/ventura/speciesinfo/protocols_guidelines/docs/dt/DT_Pre-project_SurveyProtocol_2009_FieldSeason.pdf), please explain the reasons. Was approval granted for any survey work conducted outside the spring and fall seasons by USFWS?

6. If surveys were conducted outside recommended USFWS protocol seasons, discuss how survey numbers would be as accurate as those obtained during optimal activity seasons.

7. Provide temperature data collected during surveys. Were surveys conducted when air temperatures were above 40 degrees Celsius?

8. Indicate whether any desert tortoises were handled during Project surveys. If tortoises were handled, please provide documentation of the section 10(a)(1)(A) permit(s) issued by the USFWS authorizing handling.

9. Discuss how tortoise abundance estimates may be skewed by rainfall estimates that are not on site.

Protection Status: Unless the No Action alternative is taken and cumulative degradation and fragmentation of habitat is avoided, we are concerned that the desert tortoise in the northeastern Evolutionarily Significant Unit will be upgraded from Federally Threatened to Federally Endangered.

We sent the below letter to both the BLM and Fish and Wildlife Service last August. We received no response.

Roy C. Averill-Murray
Desert Tortoise Recovery Coordinator
U.S. Fish and Wildlife Service
Desert Tortoise Recovery Office
1340 Financial Blvd, #234
Reno, NV 89502

Ron Wenker
Nevada State Director
Bureau of Land Management
Nevada State Office
P.O. Box 12000 (1340 Financial Blvd.)
Reno, NV 89520-0006

Las Vegas Field Office
Bureau of Land Management
Attn: Gregory Helseth
4701 North Torrey Pines Drive
Las Vegas, NV 89130–2301

Ron Wenker, Nevada State BLM Director - Ron_Wenker@blm.gov

Gregory Helseth, BLM Las Vegas office - Nextlight_Primm_NV_SEP@blm.gov

Bob Williams, U.S. Fish and Wildlife Service - Bob_D_Williams@fws.gov

To Whom It May Concern,

We are very concerned with the Bureau of Land Management's (BLM) plan to consider approval of the proposed NextLight Renewable Power, LLC, Silver State North Solar Project and Silver State South Solar Project, located near Primm, Nevada (Federal Register Notice LLNVS0100.L51010000.ER0000.LVRWF09F8770; NVN-085077 and NVN-085801; 09-08807; TAS: 14X5017)

Nextlight proposes to blade, level and clear 4,640 acres of some of the most high quality desert tortoise (*Gopherus agassizii*) habitat in the Mojave Desert.

The sign of tortoises is abundant on the proposal site: many active desert tortoise burrows, pallets, carcasses, tracks, and fresh scats. The amount of tortoise sign visible from just a reconnaissance walk is enough for us to raise serious concern about how this project could significantly impact an otherwise robust population.

The habitat is characterized by a large bajada draining the Lucy Grey Mountains to the east with an approximate elevation between 2,000 and 3,000 feet. The soil is eroded granite making a suitable substrate to support a robust population of desert tortoise and other fossorial fauna.

The plant community consists primarily of:
Creosote bush (*Larrea tridentata*)
Bursage (*Ambrosia dumosa*)
Rhatany (*Krameria* sp.)
Mojave yucca (*Yucca schidigera*)
Big galleta grass (*Hilaria rigida*)
Woolly plantain (*Plantago ovata*)
Silver cholla (*Cylindropuntia echinocarpa*)
Catclaw acacia (*Acacia greggii*)

The proposed project site is located within Northeastern Recovery Unit first outlined in the 1994 Desert Tortoise (Mojave Population) Recovery Plan. The site was also once in the proposal for the Piute-Eldorado Desert Wildlife Management Area (DWMA). The site appears to be in very good shape for recovery. There is very little sign of off highway vehicle use and minimal sign of invasive species. This site could qualify for a DWMA. The 1994 Recovery Plan states that "Large blocks of habitat, containing large populations of the target species, are superior to small blocks of habitat containing small populations." Our observations of the site indicate that it would meet these criteria.

We are concerned with the recent push by the Department of the Interior to develop so much public lands for large scale renewable energy projects. The Nextlight South is only half of their proposed project. This combined with the many thousands of acres being pursued for development by several other companies could very well lead to the extinction of significant tortoise populations. Development of just one of these projects would be so large that it could cut off the connectivity that many wildlife species require to maintain their genetic diversity.

We do not believe that it is possible to mitigate the destruction that the development of this parcel of 4,640 acres of land would cause. Where would you possibly translocate all of those tortoises? How could you find a piece of suitable land with a carrying capacity large enough to accommodate all of these animals? We also do not believe it is possible to even find all the tortoises on the site. It is very large and the topography is very complex. Desert tortoise translocation was never intended to be used as a replacement for habitat. It was intended to mitigate smaller development projects. Cumulative impacts from the many other proposed large energy projects should also be taken into consideration. If this project and projects like it are approved in the future in high quality desert tortoise habitat, we believe the desert tortoise will end up being upgraded from Threatened to Endangered.

We would like to suggest that this site be removed from consideration for large scale energy developments. We feel the Bureau of Land Management should be looking for alternatives in brown fields near urban developments and should be advocating photovoltaic systems on roof tops over the destruction of so much biological diversity on such large tracts of land. We would also like to suggest that the area slated for the Nextlight development be considered for conservation status such as an Area of Critical Environmental Concern. We also feel a very extensive survey of the site is in order and believe it should be evaluated by biologists other than those who have been hired by Nextlight.

Thank you for considering our comments.

Sincerely,

Basin and Range Watch

Burrowing Owl (*Athene cunicularia)*: All burrowing owls should be passively

removed and not actively removed or excavated from the burrow. (Passive meaning wait for the owl to come out). Avoidance of owls and restructuring of the project site may be necessary. California Department of Fish and Game protocols (Burrowing Owl Survey Protocol and Mitigation Guidelines. 1993. Prepared by the California Burrowing Owl Consortium. www.dfg.ca.gov/wildlife/nongame/docs/boconsortium.pdf, accessed November 10, 2009) will need to be implemented. The guidelines recommend that for off-site mitigation, replacement of occupied habitat with 9.75 acres of occupied habitat per pair or single owl found, or 13 acres of contiguous habitat per pair or single bird, or 19.5 acres of unoccupied habitat per pair or single bird. | 0054-61

Nelson's Bighorn Sheep (*Ovis canadensis nelsoni*) There is a potential that bighorn sheep will use fan and valley sites proposed for solar developments for winter foraging. How would development of alluvial fan impact potential desert bighorn winter forage habitat? Bighorn will often cross alluvial fans and desert floors. How would construction of such large facilities impact connectivity of bighorn sheep populations and migration corridors? | 0054-62

How will construction activities and noise affect sheep near project areas? | 0054-63

Alternatives to avoid impacts and measures to minimize impacts should be included. For example, we do not believe building an artificial guzzler would mitigate for the potential loss of springs on mountain slopes and bajadas due to groundwater pumping. | 0054-64

A pre-construction baseline of bighorn sheep use should be established, followed by intensive monitoring during construction and follow-up post construction. Please analyze potential affects to Bighorn sheep springs. | 0054-65

Living Soil Crusts: Biological soil crusts are formed by living organisms and their by-products, creating a surface crust of soil particles bound together by organic materials. Crusts are predominantly composed of cyanobacteria , green and brown algae, mosses, and lichens. Liverworts, fungi, and bacteria can also be important components.

Crusts contribute to a number of functions in the environment. Because they are concentrated in the top 1 to 4 mm of soil, they primarily effect processes that occur at the land surface or soil-air interface. These include soil stability and erosion, atmospheric nitrogen fixation, nutrient contributions to plants, soil-plant-water relations, infiltration, seedling germination, C02 offsets and plant growth. Crust-forming cyanobacteria have filamentous growth forms that bind soil particles. These filaments exude sticky polysaccharide sheaths around their cells that aid in soil aggregation by cementing particles together. Fungi, both free-living and as a part of lichens, contribute to soil stability by binding soil particles with hyphae. Lichens and mosses assist in soil stability by binding particles with rhizines/rhizoids, increasing resistance to wind and water action. The increased surface topography of some crusts, along with increased aggregate stability,

0054-61
Biological Resources
Your statement is included in the public record and will be taken into account by decision-makers when they consider the proposed project.

0054-62
Biological Resources
The Proposed Project lies outside of the desert bighorn sheep's wintering range.Chapter 4 under the section title Special Status Wildlife Species the issue of migratory corridors is discussed.

0054-63
Biological Resources
The following text is included in Chapter 4 under the Special Status Species : This species would be susceptible to visual and noise disturbance during construction activities and O&M, potentially resulting in alteration of their seasonal movement behavior between the Spring and Clark mountains and the McCullough and Highland mountains. However, the Proposed Project area would not result in a major barrier to the desert bighorn sheep during their seasonal movements. Under Proposed Project design, desert bighorn sheep would be able to move through the Proposed Project area via the two drainage control features that lie outside of the perimeter fence. Additionally, the total size of the Proposed Project area is not large enough to prevent desert bighorn sheep from circumventing the site when compared to the distance that migrating desert bighorn sheep would travel if migrating from the McCullough and Highland mountains in Nevada to the Spring and Clark mountains in California.

0054-64
Biological Resources
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0054-65
Biological Resources
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further improves resistance to wind and water erosion. Crusts can alter water infiltration. Studies where crusts greatly increase surface roughness generally have increased infiltration with the presence of crusts. Where crusts do not significantly increase surface roughness, infiltration is generally reduced due to the presence of cyanobacterial filaments. Differences in findings are therefore site specific and also related to soil texture and chemical properties of the soil.

Living soil crusts also store C02 and their removal may contribute to a lack of organic offsets anthropogenic greenhouse gas emissions. It would be a wise idea for BLM to calculate the amount of C02 that the removal of 4,000 acres of soil crust and vegetation would offset. 0054-66

Cumulative Impacts: We request that BLM carefully consider the cumulative impacts on desert tortoise, bighorn sheep, other wildlife, rare plants and plant communities, water and soil resources, visual resources, and recreational multiple use of both southern Nevada public lands. Very significant industrialization of scenery, habitat degradation and fragmentation, reduction of soil and vegetation carbon sequestration, water use, loss of tourism dollars, and loss of multiple use on lands outweighs any small benefits of reducing carbon emissions by a small amount. The large footprint on multiple use land and very small amount of electricity actually generated leads us to request the No Action alternative, giving stakeholders more time to discuss better siting of these power plants.

Conclusion: While the use of solar energy is a clean technology, it is not environmentally responsible unless it is sited properly. Because solar energy requires so much space to produce the desired amount of energy from any given project, it will have a massive footprint if it is placed on relatively undisturbed land. Fortunately, that space on disturbed land is available in the state of Nevada and there are plenty of places that this technology should be used on. Urban centers in Southern Nevada have limitless unused roof tops, parking lots, billboards, degraded urban lots, etc., etc, that have not been utilized yet for this technology. The BLM lands in the area of the project site are preserved for multiple use activities, but giving away so much land for energy development only conforms to one user group, energy developers. There are alternatives to this kind of "energy sprawl". For many reasons, we support the No Action Alternative. 0054-67

Thank you,

Kevin Emmerich
Laura Cunningham
Basin and Range Watch
P.O. Box 70

0054-66
Biological Resources
Your statement is included in the public record and will be taken into account by decision-makers when they consider the proposed project.

0054-67
General, Does Not Support
Your statement is included in the public record and will be taken into account by decision-makers when they consider the proposed project.

Beatty, NV 89003
www.basinandrangewatch.org

May 31, 2010

Gregory Helseth
Renewable Energy Project Manager
Pahrump Field Office
Bureau of Land Management
4701 North Torrey Pines Drive
Las Vegas, NV 89130-2301
Nextlight_Primm_NV_SEP@blm.gov

Dear Gregory:

The Nevada Wilderness Project's (NWP) "*smart from the start*" program advocates addressing issues such as habitat fragmentation and loss of resource values on public lands before renewable energy projects are sited. By using best available information, combined with renewable industry requirements, our goal is to identify the best solution through partnerships and legislative action. We strive to push for a proactive approach where the most important cultural and natural resources are protected while supporting these projects.

On behalf of the Nevada Wilderness Project, I would like to thank you for the opportunity to comment on the Bureau of Land Management's Silver State Solar Energy Project (NVN-085077). First, I have provided some general comments, which are followed by some project specific ones.

GENERAL COMMENTS

First, it is NWP's position that immediate steps are required to combat global climate change, and that a transition to renewable energy production is key to meeting this critical need. Moreover, NWP recognizes that this transition needs to occur in a timely orderly manner or we will be unlikely to reverse the catastrophic consequences of climate change. With this in mind, we are committed to making sure that this renewable energy transition occurs in a fashion that is *smart from the start*.

NWP recognizes that much of the BLM lands in Nevada have seen cumulative impacts from various land uses that have fragmented, degraded or destroyed wildlife habitats, especially in southern Nevada. We applaud the Bureau of Land Management (BLM) consideration of the cumulative impacts of land use including additional proposed renewable projects and management activities as they are related to cultural resources and wildlife and their habitats in a more holistic fashion. We believe that additional development of BLM lands should not occur unless significant wildlife habitat mitigation or conservation on public lands occurs in tandem. This solar project and other future development on BLM lands should have conservation offsets for cumulative impacts in the form of strong, permanent protection of landscapes that possess high quality wildlife habitats, cultural or other unique resources. This protection may be in the form of administrative designations, assuming such designations have strong, enforceable management language that will remove threats to further degradation of resources, or through specific agency requests for legislative designations that would add important areas to the National Landscape Conservation System. This is a much-needed paradigm shift for how the BLM does business regarding development projects on public lands. NWP values the

designation of areas dedicated to solar development to help reduce global climate change and to improve our country's national security. But we also recognize these designations are single-use management activities because utility-scale solar projects are not compatible with many other uses, such as primitive recreation or wildlife management. Because fencing and clearing of the ground surface is typically required, these actions will alter the fragile Mojave and Great Basin Desert landscapes in Nevada in ways that cannot be restored to their native condition. Appropriate mitigation through landscape protections might best be achieved by administratively designating Areas of Critical Environmental Concern (ACEC) unless the agency develops other administrative designations that could better provide permanent habitat conservation of valuable landscapes. These ACECs would need strong implementation of conservation and mitigation in their establishment, permanent mineral withdrawals and management language that clearly specifies the value of wildlife habitat as the priority purpose of these set-asides.

SITE-SPECIFIC COMMENTS

In this section, I provide some information pertaining the alternative presented in the DEIS. NWP supports the use of an EIS for projects of this scale rather than the use of an EA in order to effectively address direct, indirect, and cumulative impacts to public lands and adequately weight the need for this renewable energy project.

First, NWP considers the siting of this project appropriate for its proximity to in-place transmission and transportation corridors which reduces the requirement for additional infrastructure. Its location in a valley that is planned to be developed is appropriate leaving other more pristine areas of southern Nevada's Mojave Desert to remain without major impacts. I support the preferred alternative, (Alternative 2) because of the reduced disturbance footprint thereby reducing damage to habitat. I applaud the Applicant's choice of technology which reduces the total acreage footprint and reduced water consumption. As you know PV technology requires dramatically less water than a CSP system. Water is a critical resource in southern Nevada from a habitat perspective, as well as, our communities overall economic wellbeing. With the use of this technology, visual impacts will be reduced, along with effects on nearby *responsible* ORV recreation. Alternative 2, as described will also not have any major adverse impacts on the existing management plan for recreation in the Jean/Roach Lake Special Recreation Management Area.

SUMMARY

The Nevada Wilderness Project appreciates the opportunity to provide our comments on the sites selected for the DEIS. We recognize the scope of the challenge faced by both the general public and the BLM to adequately address these issues in an effective and expeditious manner. However, it is our belief that with great challenges come great opportunities. We urge the BLM to think creatively on how to maximize conservation mitigation opportunities within the development process, and think "outside the box" on how cumulative impacts from energy development on public lands might also yield cumulative benefits from creative conservation mitigation. Seizing this opportunity to make energy development "smart from the start" is critical in this early stage of the renewables boom that is coming to Nevada.

Myself or other NWP staff are happy to make ourselves available to meet and discuss or further develop the any of the information we have provided on behalf of the Nevada Wilderness Project.

Sincerely yours,

Greg Seymour
Renewable Energy Program Coordinator
Nevada Wilderness Project
P.O. Box 571675
Las Vegas, NV 89157
775-296-3592
greg.seymour@wildnevada.org
www.wildnevada.org

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0055-1
General
Your statement is included in the public record and will be taken into account by decision-makers when they consider the proposed project.

Marilyn L. Skender
A Professional Corporation
Attorney and Counsellor at Law

5420 Kietzke Lane, Suite 108
Reno, Nevada 89511

mskender@skenderlaw.com

Telephone 775.853.8100
Facsimile 775.853.8112

May 31, 2010

Via facsimile 702-515-5023; and via e-mail Nextlight_Primm_NV_SEP@blm.gov

BLM, Las Vegas Field Office
Attn: Greg Helseth
Renewable Energy Project Manager
4701 N. Torrey Pines Drive
Las Vegas, Nevada 89130

Re: Draft Environmental Impact Statement for Nextlight Renewable Power, LLC – Silver State Solar Energy Project (NVN 085077)

Dear Mr. Helseth:

I represent Primm South Real Estate Company, Primm 650 Limited Partnership, Primm 120 Limited Partnership and Dry Lake, Inc. (collectively the "Primm Entities"). The Primm Entities own 700 plus acres of land at Primm, Nevada. Portions of this land are leased to three hotel casinos (Whiskey Pete's Hotel & Casino, Primm Valley Resorts Hotel & Casino and Buffalo Bill's Hotel & Casino), a truck stop, the Fashion Outlet of Las Vegas shopping mall, a convenience store, the Walter M. Higgins Power Generation Station and the NVEnergy (Bighorn) substation. These improvements are the nearest exiting improvements to the proposed Silver State Solar Energy Project (the "Project"). Furthermore, Primm South Real Estate Company has the vast majority of water rights in close proximity to the Project. It is of concern to the Primm Entities and their tenants that the proposed Project may negatively affect the use and operations of their tenants' improvements, future development of the Primm Entities' lands, and the existing ground water.

The comments herein address concerns related to the Draft Environmental Impact (DEIS) Statement for the Silver State Solar Energy Project (NVN 085077) and are specific to (1) ground water withdrawal, (2) erosion control, and (3) access roads, traffic impact and business impact.

1. Ground Water

The DESI states that groundwater withdrawal will consist of 21 acre feet per year (AFY) of permanent long-term supply and 600 AFY of groundwater withdrawal for construction purposes with no more that 200 AFY withdrawn in any one year. Based on analyses completed in the DEIS water resources sections, there appears to be a lack of data, analyses and results

0056-1

0056-1
Water Quality and Hydrology
The potential project effects on water supplies are described in the DEIS in section 4.5.2. as well as the Next Light Silver State - Groundwater Availability Study (2009). The Study modeled drawdown for two well scenarios, a 600 foot well and a 800 foot well. Under both simulations, representing pumping during project construction and operation, drawdown during the operation (long term) of the project was small (less than a foot at a distance of 3 miles from the well). Under an extreme peak demand scenario (continuous pumping of 550,000 gal/day during project construction), drawdown at 200 feet from the 600 foot deep well was simulated at about 19 feet; drawdown 200 feet from the 800 foot deep well was about 10 feet.

The estimated 550,000 gal/day scenario corresponds to filling water trucks periodically during a day. However, the instantaneous groundwater withdraw will be reduced by pumping groundwater to a pond. The pond will have a volume of about 2 million gallons. Were the peak demand to persist for 10 days, the demand could be satisified with a groundwater pumping rate of 240 gal/min and utilization of the storage within the pond. While such an extended demand is unlikely, it defines an upper boundary to the required groundwater-pumping capacity.

The project will obtain water from the Las Vegas Valley Water District, which currently has water available to meet the project's demands. However, if at any time the District or NDEP feels that its customers are being compromised, the project will be required to recharge the aquipher at a rate of 270 afy for the continued life of the project. Under the terms of the Water Service Agreement, the project wells will be metered and the project will be required to submit monthly water use reports to the District. The District will also have access to the wells for meter reading, water quality, and water level sampling.

Water rights for the project will be reviewed by the State Engineer prior to being issued in order to determine if there is sufficient groudwater for the life of the project.

related to the effects of groundwater withdrawal on existing and adjacent water rights owners and water users. As such, comments below are specific to water resources with the intent for this missing information to be included in the Bureau of Land Management's (BLM) ongoing environmental analyses. It is important that the appropriate level of groundwater evaluation be completed for the proposed Project. Based on the water resources sections in the DEIS, there appears to be missing data, analyses, results to back up the interpretations, i.e., there will be no drawdown, only local and short-term effects, or groundwater withdrawal would not adversely affect water supply or cause drawdown, etc.

Primm South Real Estate Company is concerned that the Project could adversely affect its water supply wells that are within ½ mile of the proposed pumping center(s). A more complete groundwater analysis and establishment of monitoring wells between the proposed project and Primm wells would be helpful to minimize Primm concerns.

The Primm Entities' specific comments to the DEIS (NVN 085077) concerning ground water withdrawal are as follows:

Page 2-19 Figure 2.5-1 Site Map

Please show the proposed locations of the two wells: one construction well and the one permanent well.

Page 2-35, Section 2.6.6 Proposed Project Water Supply

Please clarify that the total use in any one year shall not exceed 200 acre feet as stated on Page ES-6 and in Section 4.5.2; rather than the statement "The maximum volume of construction water in any given year is not expected to exceed 200 acre feet."

Page 2-39 Section 2.6.6 septic fields

Please clarify the permitting requirement for the use of septic fields and show effects of waste system disposal on groundwater resources.

Page 3-25, Section 3.5.2 Groundwater Resources

Please expand on the source water assessment for "Whiskey Pete's Hotel and Casino..."

Note that Primm South Real Estate Company ("Primm South") owns Nevada Division of Water Resources (NDWR) permits to appropriate water of the State of Nevada (Nos. 50808, 51870, 51871, 51872, 51873, 52087, 52088, 52686, 52687, 63594 and 68945) and associated wells. Within ½ mile of the proposed Project's construction water supply well and permanent well are four active Primm South water supply wells with a quasi-municipal and power generation matter of use. There are numerous monitoring wells associated with Primm and others that do not appear to have been included in this evaluation.

0056-1 cont'd
Water Quality and Hydrology

0056-1 Continued

The availability of groundwater for the project was analyzed in the Next Light Silver State - Groundwater Availability study (2009), which used computer modeling to simulate two well scenarios (a 600 foot deep well and an 800 foot deep well) for both project construction and operations. The Study also looked at existing data for 23 wells in the project vicinity; all well data was provided by the Nevada Division of Water Resources.

0056-2

The Study modeled drawdown for two well scenarios, a 600 foot well and an 800 foot well. Under both simulations, representing pumping during project construction and operation, drawdown during the operation (long term) of the project was small (less than a foot at a distance of 3 miles from the well).

0056-3

Under an extreme peak demand scenario (continuous pumping of 550,000 gal/day during project construction), drawdown at 200 feet from the 600 foot deep well was simulated at about 19 feet; drawdown 200 feet from the 800 foot deep well was about 10 feet.

0056-4

0056-2
Water Quality and Hydrology

0056-5

The potential project effects on water supplies are described in the DEIS in section 4.5.2. as well as the Next Light Silver State - Groundwater Availability Study (2009). The Study modeled drawdown for two well scenarios, a 600 foot well and an 800 foot well. Under both simulations, representing pumping during

0056-6

project construction and operation, drawdown was small (less than a foot at a distance of 3 miles).

0056-7

Water for the project would be obtained through an agreement with the Las Vegas Valley Water District; currently water use in the Ivanpah Valley North Hydrographic Basin for LVVWD customers is significantly lower then water commimitments. However, should the LVVWD or NDEP deem at any time that the project is impacting its ability to service its customers, then the project will be required to recharge the aquifer. The recharge

would occur through rapid infiltration basins of treated effluent from the two Jean correctional facilities.

The project wells would be metered and the project would submit monthly water usage reports to the LVVWD. The LVVWD also would have access to the wells for meter reading, water quality, and water level sampling.

0056-3
Water Quality and Hydrology
The location of the proposed wells is shown on Figure 2 of the NextLight Silver State - Groundwater Availability Report.

0056-4
Water Quality and Hydrology
Chapter 2 has been revised to provide greater clairity with respect to water usage. The proposed project would require 600 acre-feet of water over the four-year construction period and 21 acre-feet per annum (AFA) for O&M activities.The maximum volume of construction water in any given year is not expected to exceed 200 acre feet.

0056-5
Project Description
Comment is addressed in section 4.5.2. and 4.15.2. A small number of people would be using the installed septic system and the system would only be installed and maintained in compliance with State requirements.

0056-6
Water Quality and Hydrology
Comment addressed in section 3.5.2. The Whiskey Pete's Sourcewater Assessment (#NV0001073) may be viewed at the NV Bureau of Safe Drinking Water's Carson City Office between 8am-5pm, M-F.

0056-7
Water Quality and Hydrology
The availability of groundwater for the project was analyzed in the Next Light Silver State - Groundwater Availability study, which used computer modeling to simulate two well scenarios (a 600 foot deep well and an 800 foot deep well) for both project construction and operations. The Study also looked at existing data for 23 wells in the project vicinity; all well data was provided by the Nevada Division of Water Resources.

Page 3-26, Section 3.5.2.2 Water Use and Discharge

Regarding the statement, "One site is sourced by effluent from the Primm Wastewater Treatment Plant and permitted for power and water storage at the adjacent NV Energy Walter M. Higgins Power Generating Station." Please revise because none of Primm South's wells discharge effluent from the Primm Wastewater Treatment Plant.

Page 4-21 Section 4.5.2 Direct and Indirect Effects by Alternative
Effect WATER-1

Please provide the data, analyses, results, and interpretations that purport to supports the statement "Applicant analyzed 23 wells in the immediate vicinity of the Proposed Project to determine the required well depth and assess water supply and draw down effects."

As stated "The well analysis concluded that water consumption for the Project would not adversely affect water supply or cause draw down, with the use of temporary storage pond." Please include data, analyses, results, and interpretations to support this statement. In addition, clarify how the statement "... with the use of temporary storage pond" relates to not adversely affecting water supply or causing drawdown.

Please include a statement that beyond LVVWD's approval for use of their water rights that NDWR would have to approve a water rights change application for the proposed Project's use.

Page 4-22 Section 4.5.2 Direct and Indirect Effects by Alternative
Effect WATER-1

The statement, "Effects to drawdown would only be a concern during peak water usage for dust suppression." This statement contradicts the statement on the previous page and listed in the comment above. Please provide the data, analyses, results and interpretations for the groundwater analysis completed.

The statement "With the temporary storage pond system described above, effects to groundwater draw down would be localized and short-term." Please explain how the temporary storage pond system can have an influence on drawdown and how this is related to being local or short-term. In addition, define local and short-term and state the criteria by which local or short-term water level or water quality changes are acceptable.

Page 4-22 Section 4.5.2 Direct and Indirect Effects by Alternative
Effect WATER-2

Missing in this section is an analysis related to excessive groundwater withdrawal and the potential to mobilize poor quality groundwater and affect existing permitted water rights. Poor quality groundwater is known in Ivanpah Valley and has been mobilized by groundwater

0056-8
Water Quality and Hydrology
One of the surface water rights within 0.5 mile of the Project receives treated effluent water from the Primm Wastewater Treatment Plant. There are no wells which discharge effluent water.

0056-8

0056-9
Water Quality and Hydrology
The potential project effects on water supplies are described in the DEIS in section 4.5.2. as well as the Next Light Silver State - Groundwater Availability Study (2009). The Study modeled drawdown for two well scenarios, a 600 foot well and an 800 foot well. Under both simulations, representing pumping during project construction and operation, drawdown was small (less than a foot at a distance of 3 miles).

0056-9 Water for the project would be obtained through an agreement with the Las Vegas Valley Water District; currently water use in the Ivanpah Valley North Hydrographic Basin for LVVWD customers is significantly lower then water commimitments. However, should the LVVWD or NDEP deem at any time that the project is impacting its ability to service its customers, then the

0056-10 project will be required to recharge the aquifer. The recharge would occur through rapid infiltration basins of treated effluent from the two Jean correctional facilities.

The project wells would be metered and the project would submit monthly water usage reports to the LVVWD. The LVVWD also

0056-11 would have access to the wells for meter reading, water quality, and water level sampling.

0056-10
Water Quality and Hydrology
Additional language has been provided in the EIS to clarify that

0056-12 water rights for the project will be reviewed by the State Engineer prior to being issued.

0056-11
Water Quality and Hydrology
Groundwater rights in the area are held by the Las Vegas Valley Water District (LVVWD). As described in Section 3.5.2, Groundwater Resources, the Ivanpah Valley consists of

0056-13 alluvial-basin fill groundwater aquifers receiving recharge through infiltration of runoff from the mountain and alluvial fan slopes, and from direct rainfall. A water service agreement has been executed with the LVVWD for the drilling of the two wells

described above. The water rights must also be approved by the Nevada State Engineer.

0056-12
Water Quality and Hydrology
The impacts of the project on water quantity were analyzed in the Next Light Silver State - Groundwater Availability Study (2009). As described in the study, the temporary storage pond will descrease the potential for drawdown from well pumping by reducing the amount of water needing to be pumped from the wells during peak construction demands. In the study, the peak instantaneous demand during project construction was assumed to be a maximum of 500 gal/min. The peak demand corresponds to filling water trucks periodically during the day. However, the instantaneous groundwater draw would be reduced by pumping groundwater to a pond and then filling tricks from the pond. The pond would have a volume of about 2 million gallons. The peak daily demand would be about 200,000 gallons. Were the peak daily demand to persist for 10 days, the demand can be satisfied with a groundwater pumping rate of 240 gal/min and utilization of the storage within the pond. While such an extended demand is unlikely, it defines an upper bound to the required groundwater-pumping capacity for the project.

0056-13
Water Quality and Hydrology
The potential project effects on aquifer drawdown are described in the EIS section 4.5.2 as well as the Next Light Silve State - Groundwater Availability Study (2009). The Study predicted very little potential drawdown from project construction and operation based on computer simulation. However, should the project result in impacts to water quality or quanitity for users in the District, the Applicant will be required to recharge the aquifer to reduce drawdown effects.

withdrawal in the past. Please include data, analyses, results, and interpretations specific to the potential to mobilized poor quality groundwater and affect existing water rights permit owners.

The statement that "groundwater is located around 550 feet below ground surface" should be corrected.

Page 4-24 Section 4.5.2 Direct and Indirect Effects by Alternative

Please provide the data, analyses, results, and interpretations as to what effect the removal of vegetation from 2,966 acres will have on the ground water supply.

Page 4-25 Section 4.5.2 Direct and Indirect Effects by Alternative
MM WATER-1

Please include a statement that groundwater monitoring (water levels and water quality) and a groundwater monitoring plan shall be included in pre- and post-construction documents as well as part of project operations.

Page 4-133, Section 4.19.5 Existing Cumulative Conditions

Please include LVVWD in this section.

Page 4-160, Section 4.20.1.5 Water Resources/Hydrology

Please include information that groundwater withdrawal could mobilize poor quality groundwater and influence existing water rights permit owners.

Page 2-69 Table 2.10.1

Based on revisions made to the water resources section please revise Table 2.10.1 accordingly.

2. Erosion Control

The enormous scale of this proposed Project of clearing and grading 2,966 acres of land over a four year period gives it a certainty (not the suggested "potential") of wind and water erosion. The proposed Project is due east of the developments at Primm and the prevailing wind blows toward the Primm developments giving the Primm Entities great concern about the wind and water driven soil erosion. At page 4-18 of the DEIS, Effect SOIL-1: Increase in soil erosion rates it is stated "This removal of vegetation and soil crusts and grading would expose soil and increase the potential for wind-and water-driven erosion. The Proposed Project site is relatively flat, but it has the potential for high winds and infrequent strong rains." At page 4-24 the DEIS acknowledges that because of the removal of vegetation and the subsequent shading of the land

0056-14
Water Quality and Hydrology
According to the Next Light Silver State - Groundwater Availability Study (2009), the likely groundwater depth at the site of the proposed main project well is about 200 feet.

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0056-15
Water Quality and Hydrology
Aquifers in the project area receive groundwater recharge through infiltration of runoff from the mountain and alluvial fan slopes, and from direct rainfall. The removal of vegetation would decrease surface roughness and increase the potential for localized surface runoff from the site. Runoff would be channeled into existing natural drainages where infiltration would occur. The amount of impervious surface of the proposed project would be 0.05 percent of the entire Ivanpah Valley groundwater basin, most of which is undeveloped. Therefore the impact to groundwater quantity thoughout the basin would be small.

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0056-16
Water Quality and Hydrology
The applicant would implant a Groundwater Monitoring Plan during project construction and operations. The plan would include metering of project wells and quarterly reports on water use to the BLM and State Engineer.

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Water Quality and Hydrology
There is a very small chance that the change in pressure from groundwater withdrawl for the project could mobilize poor quality groundwater existing in the aquifer (as described in section 3.5.2.1). In the rare case that this should happen, it is likely that the intrusion would be directed towards project wells and not influence existing water rights owners in the vicinity of the project. Water rights for the project would be thoroughly reviewed for potential impacts to groundwater quality or quantity prior to permits being issued.

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0056-18
Water Quality and Hydrology
Table 2.10 revised with the following information:
- Drainage channels would experience greater volume and velocity of flow than pre-construction conditions; however, controlled release of runoff would reduce some erosion and sedimentation.

- Collapse or failure of the detention ponds or emergency spillway would result in an increased floodling risk.

from the PV panels, the vegetation could not be performing stabilization of the soil and may result in increased erosion.

During construction dust control will require 200 a.f.a of water; however, as soon as construction is completed the water consumption for this proposed Project drops to 21.a.f.a. It does not seem probable that without re-vegetation of the disturbed land that dust control by use of water can abruptly cease upon the completion of construction of the proposed Project. The Primm Entities concerns are that it properties will receive more wind driven soils during construction and after construction is complete than the properties current exposure to wind driven soils.

Please provide the re-vegetation plan for the proposed Project and the data and analysis showing the Primm developments will not be exposed to increased amounts of wind-driven soils during and after construction.

Please provide the soils erosion plan for the Project upon its de-activation.

3. Access roads, traffic impact and business impact.

The only proposed main access road for motor vehicle for the Project is via the I-15 interchange at Primm, NV. The DEIS acknowledges that the level of service (LOS) at both the north and south bound off-ramps is currently "**poor.**" It states that it will add 812 trips per day to this interchange. At page 4-85 of the DEIS, Section 4.13.2 it states:

> "The addition of a maximum of 812 trips entering and exiting the site during peak commute times would **further degrade traffic flow** on I-15 and associated on-ramps which are currently operating at LOS D and E (see Table 3.13-3, in Section 3.13.2 Major Traffic Routes or Adjacent to the Proposed Project Site). This would be greatest on Friday afternoons when maximum number of vehicle trips (812) per day **would be added to an already congested interstate.** Effects to I-15 would be reduced through implementation of mitigation measure MM TRAN-1." (Emphasis added.)

At page 4-86, the Applicant would "ensure an adequate flow of traffic in both directions" by implementing a "Traffic Management Plan." This plan basically consists of signage and scheduling deliveries and car polling of workers. The Applicant acknowledges that there is currently not an "adequate flow of traffic" at the Primm I-15. It is disingenuous to state that the Applicant can add more traffic and "ensure adequate flow of traffic" especially during peak usage by doing nothing more than implementing its Traffic Management Plan.

The hotel-casinos, the truck stop and the shopping mall at Primm depend upon their visitors being able to get on and off the I-15 interchange. If traffic at this interchange becomes more congested or snarled than it already is especially at peak hours, visitors will avoid getting off/on at the interchange and this will adversely impact their businesses. The construction period

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0056-19
Soils
The Proposed Project would introduce added water to the site for a variety of reasons including dust control, soil compaction and stabilization, PV solar panel washing, and miscellaneous other maintenance uses. The Applicant estimates that 600 acre-feet of water would be used on site during the construction phase of the Proposed Project with an additional estimated 21 AFA used once vegetation is re-established across the site. The majority of this 21 AFA use would be used for PV panel washing, with the remainder for dust control on roads. The Applicant estimates two PV panel washings would be required each year, but would wash PV panels as frequently as needed. This sudden introduction of additional water inputs could directly impact the composition of

0056-20

the local plant community by providing a competitive advantage to those plant species that thrive in wetter conditions. The additional water source would also provide moisture for the germination of existing seeds. Noxious/invasive weed species

0056-21

could also benefit from the additional moisture, potentially out-competing the native vegetation which thrives under xeric conditions.

0056-20
Biological Resources
The Applicant will create a vegetation restoration plan that will have to be approved by BLM. The FEIS is not required to include the vegetation restoration plan, but the plan must be submitted to and approved by BLM prior to the commencement of construction.

0056-21
Mitigation
The de-activation plan has not been finalized prior to the writing of the FEIS, however the de-activation plan will have to be submitted to and approved by BLM prior to initiation of

0056-22

construction.

0056-22
Transportation and Traffic
This mitigation measure has been updated. The Applicant will now identify an alternate route using the Yeats Well Road exit to be used during peak construction.

0056-23

0056-23
Transportation and Traffic
Traffic effects would only occur sporadically over the four year construction period. Each event would be "short term."

for this proposed Project is in excess of four (4) years. Four (4) years is not a "short-term" increase in traffic.

How will the Applicant enforce car pooling for its anticipated 230 to 400 employees? The Applicant states that it anticipates 810 trips per day. Is this number with or without car pooling by its employees?

Please show the data, analyses, results that evidences the Applicant's ability to "ensure an adequate flow of traffic in both directions" by implementing its proposed "Traffic Management Plan."

The Primm Entities are requesting that a traffic impact study and a business impact study be conducted as part of the DEIS.

At page 2.14, Section 2.5.3 of the DEIS , it states that once Applicant's motor vehicles exit at the Primm I-15 interchange, access to the Project site will be by a new 1.55 mile long paved public road that is to constructed on the alignment of the existing road form the I-14 frontage road to the proposed site. Please provide a site map of this proposed new road.

At page 2-24, Section 2.5.3 of the DEIS, it states that if this new road is not constructed the Applicant would construct an alternate .3 mile-long road paved road from the existing Primm Boulevard to the proposed site using the UPRR overpass that currently provides access to the NVEnergy Walter M. Higgins Power Generating Station. Primm South Real Estate Company owns the land upon which the mentioned UPRR overpass is located and it has not granted access over its land for this purpose.

In conclusion, the Primm Entities and its tenants are concerned that the proposed Project could adversely affect their water supply, subject the developments at Primm to increased amounts of wind-driven soil erosion, create traffic congestion that will not be mitigated by the Applicant's proposed Traffic Management Plan and adversely affect the existing businesses at Primm. However, we would like the opportunity to meet with the Silver State Solar Energy Project contractors to voice our concerns and to facilitate the best interests of all the parties involved.

Sincerely,

Marilyn L. Skender

cc: Gary E. Primm, President
Sean Higgins, General Counsel
Robert Swadkins, V.P. Finance

0056-23 cont'd
Transportation and Traffic
Continuation of comment

0056-23 Continued

0056-24
Transportation and Traffic
0056-24 The BLM will work with the Applicant to enforce all mitigation measures identified in the EIS. The 810 vehicle trips/day is a worst case scenario without carpooling.

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0056-25
Transportation and Traffic
MM-TRAN1 now requires the Applicant to identify an alternate
0056-26 acces route using the I-15 / Yeats Well Rd offramp. It is reasonable to assume that effects to the I-15 / Primm Blvd.
0056-27 offramp can be minimized through enforcement of this MM.

0056-26
Transportation and Traffic
Comment noted. Project-specific traffic plans have not been conducted for other energy projects in the region.

0056-28

0056-27
Transportation and Traffic
Figure 2.2-1 has been updated.

0056-28
Transportation and Traffic
0056-29 Comment noted. Land negotiations between the applicant and third parties are outside of the scope of this analysis.

0056-29
General
Your statement is included in the public record and will be taken into account by decision-makers when they consider the proposed project.

Arthur + Peg
Rinehart
1650 Trailing Rose.
HCR 31 Box 346
Sandy Valley,
NV 89019-8711

LAS VEGAS NV 890

From:

[redacted]

2010 PM 2 T

Animal Rescue
saintsstoutheres

RECEIVED
Bureau of Land Management
07:30
MAY 10 2010
LAS VEGAS FIELD OFFICE
Las Vegas, Nevada

I would like to receive the following information about the project:

● Final EIS on CD

○ Remove my name from your mailing list

My email address is:
do not have, can't see to use

To:
Bureau of Land Management
Las Vegas Field Office
Attn.: Greg Helseth, Renewable Energy Project Manager
4701 N. Torrey Pines Drive
Las Vegas, NV 89130

891302301

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The BLM welcomes your comments on the Draft EIS for the Silver State Solar Project. You can detach and mail this card by putting postage on the reverse side (and checking the boxes for any publications you wish to receive). Other options for submitting your comments are listed above.

This is more than welcom news.
Or Why has it taken so long? You have
my full support or I should say "Our".
This is a wonderful use of public lands.

0057-1

0057-1
General
Your statement is included in the public record and will be taken into account by decision-makers when they consider the proposed project.

From: LAS VEGAS NV 890

DEAN DAVIS
NAME
HCR 31 Box 825
STREET ADDRESS
SANDY VALLEY, NV 89019
CITY/STATE/ZIP

I would like to receive the following information about the project:

O Final EIS on CD

O Remove my name from your mailing list

My email address is:
davisla@sandyvalley.net

To:
Bureau of Land Management
Las Vegas Field Office
Attn.: Greg Helseth, Renewable Energy Project Manager
4701 N. Torrey Pines Drive
Las Vegas, NV 89130

92301

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[Detach and return this portion]

DEAN DAVIS
NAME
HC31 Box 825
STREET ADDRESS
SANDY VALLEY NV 89019
CITY/STATE/ZIP

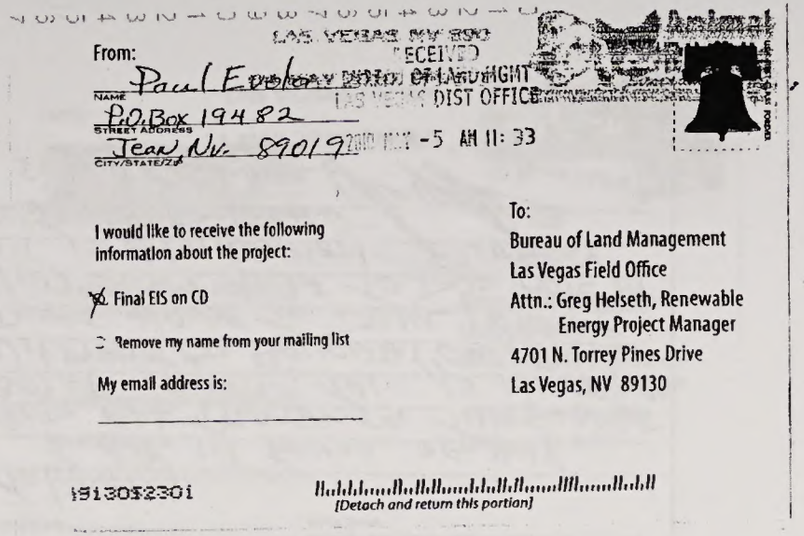
The BLM welcomes your comments on the Draft EIS for the Silver State Solar Project. You can detach and mail this card by putting postage on the reverse side (and checking the boxes for any publications you wish to receive). Other options for submitting your comments are listed above.

I AM 100% IN FAVOR of SOLAR, WIND, NUCLEAR & CLOSED CYCL GENERATION FOR POWER - MY OVERRIDING QUESTION IS - WHERE IS THE WATER COMING FROM? I KNOW CORIOUS AMOUNTS HAVE REGARDED AND HAVE NOT SEEN MUCH EVIDENCE OF IT IN THE AREA YOU DESCRIBE.

THANK YOU
D DAVIS

0058-1

0058-1
General
Your statement is included in the public record and will be taken into account by decision-makers when they consider the proposed project.



From:
Paul Evola
NAME
P.O. Box 19482
STREET ADDRESS
Jean, Nv. 89019
CITY/STATE/ZIP

LAS VEGAS NV 890
RECEIVED
BUREAU OF LAND MGMT
LAS VEGAS DIST OFFICE
-5 AM 11:33

I would like to receive the following information about the project:

☒ Final EIS on CD

☐ Remove my name from your mailing list

My email address is:

To:
Bureau of Land Management
Las Vegas Field Office
Attn.: Greg Helseth, Renewable Energy Project Manager
4701 N. Torrey Pines Drive
Las Vegas, NV 89130

1913052301

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0059-1

[Detach and return this portion]

Paul Evola
NAME
2365 Gypsum
STREET ADDRESS
Sandy Valley, Nv. 89019
CITY/STATE/ZIP

The BLM welcomes your comments on the Draft EIS for the Silver State Solar Project. You can detach and mail this card by putting postage on the reverse side (and checking the boxes for any publications you wish to receive). Other options for submitting your comments are listed above.

I'm happy to see alternative power sources starting up here in Nevada. Even though we have free power from the Dam, the price still keeps going up every year. As our population keeps growing we are going to need more power so we should start building these clean methods of generating power now. Environmental Impact at the proposed area seems minimal to me.

0059-1
General
Your statement is included in the public record and will be taken into account by decision-makers when they consider the proposed project.

From:

IVAN JENNER
HC 31 BOX 746
SANDY VALLEY NV 89019-8961
CITY/STATE/ZIP

RECEIVED
Bureau of Land Management
07:30
MAY 17 2010
LAS VEGAS FIELD OFFICE
Las Vegas, Nevada

I would like to receive the following information about the project:

[X] Final EIS on CD

[ ] Remove my name from your mailing list

My email address is:

To:
Bureau of Land Management
Las Vegas Field Office
Attn.: Greg Helseth, Renewable Energy Project Manager
4701 N. Torrey Pines Drive
Las Vegas, NV 89130

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[Detach and return this portion]

IVAN JENNER
HC 31 BOX 746
SANDY VALLEY NV 89019-8961
CITY/STATE/ZIP

The BLM welcomes your comments on the Draft EIS for the Silver State Solar Project. You can detach and mail this card by putting postage on the reverse side (and checking the boxes for any publications you wish to receive). Other options for submitting your comments are listed above.

TO (DEIS)
I AM IN FAVOR OF ANY AND ALL PROJECTS THAT USE SOLAR POWER, THIS IS NEVADAS UNLIMITED SAUCE OF POWER, YOU DONT HAVE TO DRILL FOR IT, YOU DONT HAVE TO DIG FOR IT IT IS ENVIRONMENT FRIENDLY WE NEED MORE
IVAN, C.T. JENNER

0060-1

0060-1
General
Your statement is included in the public record and will be taken into account by decision-makers when they consider the proposed project.

LAS VEGAS NV 890

From:

11 MAY 2010 PM 3 L

Walter Martin
HC 31 Box 247
Sandy Valley, NV 89019

RECEIVED
Bureau of Land Management
07:30

MAY 12 2010

LAS VEGAS
FIELD OFFICE
Las Vegas, Nevada

I would like to receive the following information about the project:

- O Final EIS on CD
- O Remove my name from your mailing list

My email address is:

_____

To: Bureau of Land Management
Las Vegas Field Office
Attn.: Greg Helseth, Renewable Energy Project Manager
4701 N. Torrey Pines Drive
Las Vegas, NV 89130

3913032301

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[Detach and return this portion]

Walter Martin
HC31 Box 247
Sandy Valley, NV 89019

The BLM welcomes your comments on the Draft EIS for the Silver State Solar Project. You can detach and mail this card by putting postage on the reverse side (and checking the boxes for any publications you wish to receive). Other options for submitting your comments are listed above.

IF THIS SILVER STATE SOLAR PROJECT WAS SET UP SOME PLACE IN NEVADA, SAY IN DELMAR VALLEY. IT MIGHT HELP. ALAMO-ASH SPRINGS-HIKO-CALIENTE-TONOPAH PIOCHE -- WHY NOT IN AUSTIN OR EUREKA OR MABY - TONOPAH? THAT MIGHT HELP NEVADA BUT NO YOU PUT IT ON THE NEVADA BORDER AND IT WILL ALL GO TO SUCK STATE CALIFORNIA. PUT IT IN CALIF. NOT NEVADA

0061-1

0061-1
General, Does Not Support
Your statement is included in the public record and will be taken into account by decision-makers when they consider the proposed project.

R Miller
NAME
HCR 31
STREET ADDRESS
Sandy Valley, NV
CITY/STATE/ZIP

RECEIVED
Bureau of Land Management
07:30
MAY 14 2010
LAS VEGAS
FIELD OFFICE
Las Vegas, Nevada

I would like to receive the following information about the project:

- O Final EIS on CD
- O Remove my name from your mailing list

My email address is:

_____

To:
Bureau of Land Management
Las Vegas Field Office
Attn.: Greg Helseth, Renewable Energy Project Manager
4701 N. Torrey Pines Drive
Las Vegas, NV 89130

1513032301

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0062-1

[Detach and return this portion]

Robin Miller
NAME
HCR 31
STREET ADDRESS
Sandy Valley, NV 89019
CITY/STATE/ZIP

The BLM welcomes your comments on the Draft EIS for the Silver State Solar Project. You can detach and mail this card by putting postage on the reverse side (and checking the boxes for any publications you wish to receive). Other options for submitting your comments are listed above.

WE DO NOT WANT WINDMILLS! Spent lots of TIME IN Palm Springs AND they ARE AN EYE SORE!!! and the locals never see a time OF Savings on their Billing, the Power is stored and sold off THE Solar Panels would be the same thing, Why Should we have to look at that mess so Someone ELSE CAN Put Money in there pockets. WE SAY "NO" TO THE PROJECT — BLM - Say - NO —

0062-1
General, Does Not Support
Your statement is included in the public record and will be taken into account by decision-makers when they consider the proposed project.

United State Department of the Interior
Bureau of Land Management
Southern Nevada Destrict Office
4701 North Torrey Pines Drive
Las Vegas, NV 89130
http://www.blm.gov/nv/st/en/fo/lvfo.1.html
Nextlight_Primm_NV_SEP@blm.gov

DATE: April 28, 2010

Division of Water Resources

USDI # N-085077 2800 (NVS3100)
Project: Silver State Solar Project

____No comment on this project ____Proposal supported as written

AGENCY COMMENTS:

There are no active water rights appurtenant to the described lands in this proposed project.

Please be advised that wells and/or points of diverting water on these lands, whether new or existing, shall require prior approval from the Nevada Division of Water Resources. All waters of the State belong to the public and may be appropriated for beneficial use pursuant to the provisions of Chapters 533 and 534 of the Nevada Revised Statutes (NRS), and not otherwise. Water wells must be permitted, Monitor wells require a Waiver from the State Engineer's Office, and all boreholes must be plugged within sixty (60) days after being drilled as required by NAC 534.4371. 0063-1

Any water or monitor wells, or boreholes that may be located on either acquired or transferred lands are the ultimate responsibility of the owner of the property at the time of the transfer and must be plugged and abandoned as required in Chapter 534 of the Nevada Administrative Code. If artesian water is encountered in any well or borehole it shall be controlled as required in NRS § 534.060(3). 0063-2

Any water used on the described project for construction, dust control, or maintenance should be provided by an established utility or under permit or waiver issued by the State Engineer's Office. If artesian water is located in any well or borehole it shall be controlled as required in NRS 534.060(3). 0063-3

A review of the area described in the draft shows that the project is located in three designated basins, Mesquite Valley (NDWR #163), Ivanapah Valley, Northern Part (NDWR #164A), and Ivanapah Valley, Southern Part (NDWR #164B). 0063-4

0063-1
Water Quality and Hydrology
The suggested wording has been included in the Final EIS.

0063-2
Water Quality and Hydrology
The suggested wording has been included in the Final EIS.

0063-3
Water Quality and Hydrology
The suggested wording has been included in the Final EIS.

0063-4
Water Quality and Hydrology
Your statement is included in the public record and will be taken into account by decision-makers when they consider the proposed project.

Sincerely,

Steve Shell, Staff Engineer, Nevada Division of Water Resources

Signature: //sls// Steve Shell Date: April 28, 2010

SILVER STATE SOLAR PROJECT

DRAFT ENVIRONMENTAL IMPACT STATEMENT SCOPING MEETING

REPORTER'S TRANSCRIPT OF PROCEEDINGS

On Wednesday, May 12, 2010

At 6:00 p.m.

At the M Resort

12300 Las Vegas Boulevard South

Henderson, Nevada

Reported by: Deborah Ann Hines, CCR #473, RPR

KAREN LADD: I'll give you a gentle reminder to turn your cell phones off, we'd appreciate it.

Welcome, everybody, and thank you. We're here tonight to hear your comments on the Draft Environmental Impact Statement for the Silver State Solar Project. I'm Karen Ladd. I'm with Ecology & Environment and I'm going to be moderating the meeting tonight.

I'll introduce the panel and I'll describe how the meeting is going to proceed but I want you to know that we're here tonight to hear your comments and I'll open it up for you to give comments. I'll give you three minutes to give your comments, and I'll describe that in a few minutes.

We have here up at the front Howard Levine from Ecology & Environment. He's with the third-party contractor who prepared the Draft Environmental Impact Statement, and Howard is going to give a summary of the project and describe the environmental review process.

Seated next to him is Greg Helseth with the Bureau of Land Management and he is the project manager for BLM for the project and he will be giving some introductory remarks about BLM's role in deciding whether to issue a right-of-way grant for

this project.

Next to him is Mark Chandler, who's also with the Bureau of Land Management in the lands and realty. And at the end of the table is Mike Hatfield and he's with NextLight Renewable Power and he is -- NextLight is the company that is proposing this project, and he may give a few words about the project. So I'll turn it over now to Howard.

HOWARD LEVINE: Thank you, Karen. Can everybody hear me? A little louder. As Karen said I'm the project manager for Ecology & Environment, third-party contractor to prepare the Environmental Impact Statement on behalf of the Bureau of Land Management and with the BLM, and we're in close coordination with them. So our role is to be sort of an extension of the government's staffing for this project.

The Environmental Impact Statement prepared under the National Environmental Policy Act, it's a process which began last summer with what was called scoping, which was our first -- we had some meetings here last August to hear people's comments and raise issues about the proposed project. And we had quite a few people come to those meetings and give us a lot of good ideas and good information about what the EIS

should cover.

From that we developed -- after that point we developed three alternatives, one which was required under the National Environmental Policy Act, it's a no action alternative, it's an alternative that if BLM did not allow the proposal to go forward, we would look at what the environment would look like with that, and two action alternatives to build the project. And so those were considered in the environmental, in the Draft Environmental Impact Statement that you've been reading lately.

The impact assessment performed or conducted under that EIS is in chapter four, and it goes through a pretty exhaustive consideration of all of the impacts that, potential impacts that occur under the alternatives. And the EIS also covers best management practices, mitigation that was developed as impacts were identified. These are activities that would occur over and above what's proposed by the proponent, NextLight.

We're in a 45-day comment period now on the Draft EIS. Between now and June 1st we're accepting comments on the DEIS and those will be considered in the preparation of the Final EIS, which will come out late July or early August. And then after that the

Record of Decision will be issued, which will identify BLM's decision whether to allow this project to be built on BLM land right-of-way grant, issued or not.

Some of the issues that were identified by the public and were considered in the EIS basically had to do with the proposal, the activity of putting solar arrays on up to 2900 acres of land, public land in Southern Nevada. And the issues that we've focused on were impacts to soils, water, hydrology, flooding, impacts that could occur as a result of constructing the project, flooding off of the project or the project being washed away in a high rain event, which sometimes occur around here.

And we looked at the proponent's mitigation or best design features and to determine whether they were sufficient or what sort of impacts would occur under all those alternatives. There are impacts to vegetation with that much construction out there, impacts to habitat.

There would be some displacement of animals because the property would be fenced off for security and other reasons. There would be visual impacts and impacts to recreation, and potential cumulative impacts with what else is also going on out there in

the Primm Valley, Ivanpah area.

Over in the left-hand corner here, my left, there's a project, a cumulative projects map and it shows all the projects that we considered in doing the cumulative impact assessment for the EIS. So with that I will hand it over to Greg and he will talk about BLM.

GREG HELSETH: All right. Thank you, Howard. First off I'd like to thank everyone for taking time out of their busy schedules to join us this evening. My name is Greg Helseth. I'm the renewable energy project manager for the Southern Nevada district. I report to the Pahrump Field Office.

This project is, as Howard mentioned, the cutoff period is June 1st for public comment. From there we'll be building the public comment record and having some meetings and working our way into a Final Environmental Impact Statement that we'll try to move along. Current timeline as it's coming with the FEIS possibly at the end of August and try to get that Record of Decision in September.

So that's our current timeline for this project. It is what is called a fast tracked project, which basically means that the Washington

office is observing what is going on with this project and basically a lot of reporting backwards to Washington. A lot of eyes from different sources are keeping a close tab on what's going on with this.

So again thank you all for showing up this evening. We look forward to any comments or concerns that you have this evening. And with that being said, I can pass it on to Mark and see if Mark has anything to add.

MARK CHANDLER: Thanks. I'm Mark Chandler. I'm the realty specialist here. And really also appreciate everybody being here tonight. Your comments are really important for us as we go through this process here. Many eyes look at it but sometimes if you look at a document three or four times, you tend to miss things, okay. And that's where your comments will help us prepare a better document for our decision makers. So it's really important that we concentrate on the substantive things here as you've gone through this yourselves individually. Thank you.

MIKE HATFIELD: Just introducing myself, I'm the applicant. I'm with NextLight Renewable Power. We're a developer of solar projects in the west. We're the proponent for this project. And we're here

also to listen to comments. We've just received the Draft EIS.

And I wanted to mention we have our project team here. I see a few familiar faces in the audience. We've been working on this for a number of years and I encourage you to come up and speak with us directly with any questions that you might have. And in closing, I'd just like to say that we really appreciate the hard work that BLM has done to get the project to this point. So thank you.

KAREN LADD: So now we'll open it up for taking your comments. And I just want to remind you that the purpose of the meeting is to hear your comments on the Draft EIS so that we can make sure that we incorporate substantive comments into the Final EIS. So we will not be answering questions, but the folks here and other folks who are with the BLM and with NextLight as well will be here after and they will be available to talk with you about the project.

I'll also say that tonight is not your only opportunity to provide comments. The comment period is open through June 1st, and you're welcome to send a written comment by that date. At the registration desk we have some comment forms that you're welcome

to use, you don't have to use these, but they do have the address where you can send your comments.

And in addition to tonight's meeting, we held a meeting last night in Primm, and tomorrow night there will be a meeting in Jean at the Gold Strike.

So I've got four people who have requested to give comments and I'll be calling those people in the order that they signed up. I'll be giving you three minutes to make your comment and at which time I'll go to the next person. If you haven't completed the comments within the three minutes, and we have time after, I'll give you an opportunity to speak again. And if we have time I may open it up if other people decide that they have a comment that they want to make as well.

So with that I'll start with James Halsey. If you would state your name and spell your last name. I should say we have a court reporter who's recording the meeting and your comments will become part of the public record.

JAMES HALSEY: James Halsey, H-a-l-s-e-y. I represent about 4,000 workers with the IBEW Local 357. We have many of them were trained to install these types of projects. And we look forward -- I

0064-1

0064-1
General
Your statement is included in the public record and will be taken into accounty by decision-makers when they consider the proposed project.

just want to say we're in full support of this project. We look forward to having our members work on it. That's about it.

KAREN LADD: Kevin Emmerick.

KEVIN EMMERICK: Thank you. My name is Kevin Emmerick, it's spelled Kevin, E-m-m-e-r-i-c-h. And I just want to make a brief comment about mostly the desert tortoise translocation plan. But first off I want to say I'm a little bit disturbed that BLM is considering issuing a right-of-way for this project. Green energy is a good thing, solar energy is a great thing, but you have to site it in the right place, and this is not the right place.

This has, as you know, one of the most healthy desert tortoise populations left in the Mojave Desert, and it's in the northeastern recovery unit, which is a genetically unique population of desert tortoise. Your biological report say there's about 35 desert tortoise per square mile on this site. That's very significant. And it's healthy. There's not a lot of invasive species.

At one time this area was considered to be part of an ACEC, a critical habitat, but due to politics it was excluded, and I think it should be reconsidered for that designation, not a development

0064-1 Continued

0064-2

0064-3

0064-4

0064-1 cont'd
General
Continued

0064-2
General
The proposed project was based on many factors to mitigate impacts which maintaining an efficient site design.

0064-3
Biological Resources
The proposed project was based on many factors to mitigate impacts while maintaining an efficient site design. Additionally, the Biological Opinion issued by USFWS will specifically address the impacts of the proposed project on desert tortoise.

0064-4
Biological Resources
This issue in question is outside the scope of the proposed project

of this size.

Translocation is theoretical. It doesn't always work. It's moving tortoises for a big project. I was involved in one of these projects. It was located across the road from NextLight. It's the large scale translocation site. Some people call it the dump site because they put a lot of desert tortoise there, thousands from what I understand. And it's about 12 years later and if you walk up into the canyons along that alluvial fan, or bajada, you're going to find a lot of dead tortoises.

In fact, I didn't realize how much of a failure this was. A biologist recently told me it's up to 90 percent failure rate. And the point is is when you have desert tortoise translocation, even if you have a very good biologist, you're going to have mortality, even if you do it the best possible way.

The Fort Irwin translocation is kind of famous, and that happened about two, three years ago, 75 percent of those animals died. And they were preyed upon by predators and whatnot, and now you're going to move these tortoises. And according to your population statistics, there's about 150 you're going to move but juveniles are hard to find, so there's probably going to be more like 200. And I'm really

0064-4 Continued

0064-4 cont'd
Biological Resources
Continued

0064-5

0064-5
Biological Resources
The proposed project was based on many factors to mitigate impacts while maintaining an efficient site design. Additionally the proposed Project has not determined if a relocation or translocation of desert tortoises will occur.

0064-6
Biological Resources
This issue will be specifically addressed by the Biological Opinion issued by the USFWS.

0064-7
Biological Resources

0064-6 This issue will be specifically addressed by the Biological Opinion issued by the USFWS and development of the translocation/relocation plan.

0064-7

worried that you're going to have a big mortality of desert tortoise.

Dr. Alice Karl, who does tortoise translocations, recently said at a workshop for the Ridgecrest solar power plant in California that even if it's a very good project, you will have desert tortoise mortality. And I'm afraid you're going to kill off a lot of these tortoises by trying to move them. So again I think this is a very poor location. Thank you.

KAREN LADD: Laura Cunningham.

LAURA CUNNINGHAM: Laura Cunningham, C-u-n-n-i-n-g-h-a-m. And I'd just like to say I've read the DEIS and I just thought it was really incomplete in a lot of ways. I thought that it might need to have rare plant surveys because right across the valley in California at the Ivanpah solar electric generating system they found a lot of rare plants. And so I'm kind of hoping maybe we could have gotten that in.

Also now that First Solar owns the project basically, I'm wondering why we still have a no choice on the technology. That seems like it's going to be fixed tilt now and that's kind of unclear here.

And then also I still have a question, I'm

0064-7 Continued

0064-7 cont'd
Biological Resources
Continued

0064-8

0064-8
Biological Resources
This issue will be specifically addressed by the Biological Opinion issued by the USFWS and development of the translocation/relocation plan.

0064-9
Biological Resources
A habitat assessment has been completed for the Proposed Project area, and rare plant surveys were performed in the spring of 2010. The Final EIS includes the results of these surveys (Sec. 3.6 and 4.6.)

0064-10
Biological Resources
0064-9 The proposed project was based on many factors to mitigate impacts while maintaining an efficient site design.

0064-11
Biological Resources
The FEIS will include a more indepth description of the mowing regime. Based on the present design, there will be vegetation among the solar panels that will be routinely mowed.

0064-10

0064-11

really confused about whether there will be vegetation in among the solar panels.

So I guess there's still a lot of clarity I guess that I want to see in the final. I mean, it almost seems like we should have a supplemental draft because there have been so many changes. But I appreciate all the work you've done on this, so thank you.

KAREN LADD: Don Wall.

DON WALL: Don Wall, president of SNORE. I know some of you guys. I want to thank you guys. The EIS is complete. You guys allowed a corridor. You talked to everybody. You communicated. We appreciate that.

I believe this EIS should be a baseline for a lot of these solar initiatives to make sure that recreation has corridors and accessibility to different aspects of the area. It's really important for us, for recreaters, because we are losing a resource. We've been racing out there for 40 years.

The desert tortoise is a healthy habitat out there and it still does, along with Eldorado Valley. I believe the EISs should have a basic fundamental aspect of not only competitive high speed off-road racing, which is me, but recreation in its entirety.

0064-11 Continued

0064-11 cont'd
Biological Resources
Continued

0064-12

0064-12
Biological Resources
The Final EIS incoprates all comments to the DEIS. Section 1.7 of the Final EIS describes how the Final EIS document differs from the Draft EIS based on public imput and additional information gathered by the Applicant after the release of the Draft EIS. The BLM reviewed substantive public comments and determined that the EIS would be improved by including these changes. These changes doe not meet the requirements of the NEPA regulations (40 CFR § 1502.9(c)) that mandate a supplement.

0064-13

0064-13
Recreation
Your statement is included in the public record and will be taken into account by decision-makers when they consider the proposed project.

So make sure when you guys do those EISs that you include the public when it comes to recreating: OHVs, four-by-fours, camping, things like that. That's my biggest concern.

KAREN LADD: Thanks. That's all I had on my list of people who had signed up to comment but did any of the comments that you heard or did you get anything -- we have somebody who wants to speak. Say your name and spell your last name.

ROB MROWKA: My name is Rob Mrowka, M-r-o-w-k-a, and I represent the Center for Biological Diversity. And I would just like to also raise concern about the project in relationship to the excellent desert tortoise habitat that it overlaps with.

And I guess Kevin covered it pretty well but I would just add that if the project were to go forward, I think a lot of thought needs to be given to ways to mitigate and avoid to the extent possible impacts to that habitat.

The project proposal boundary is quite large. Under the preferred alternative there seems to be a lot of perhaps wiggle room. Perhaps in the design there could be some ways to protect and preserve this quality habitat.

0064-13 Continued

0064-13 cont'd
Recreation
Continued

0064-14
Biological Resources
The proposed project was based on many factors to mitigate impacts while maintaining an efficient site design. The impacts to desert torotise will be specifically addressed by the final EIS which will include the Biological Assessement. The Biological Opinion that will be issued by USFWS will also evaluate the potential impacts to tortoises.

0064-15
Biological Resources

0064-14 The proposed project was based on many factors to mitigate impacts while maintaining an efficient site design. The impacts to desert torotise will be specifically addressed by the final EIS and by the Biological Opinion issued by USFWS.

0064-16
Biological Resources
The proposed project was based on many factors to mitigate impacts while maintaining an efficient site design.

0064-15

0064-16

So I would just ask the BLM and proponent give some serious thought to ways that tortoise and tortoise habitat could be accommodated with this project. Thank you.

KAREN LADD: Thanks. Would anyone else like to make a comment? If you would say your name and spell your last name please.

TINA PAST: Good evening. My name is Tina Past, that's spelled like past, present and future. Anyhow, I just want to speak in general terms in support of this project and I am a member of the Nevada Conservation League and Education Fund. I do their communications.

And it's not coincidence, I don't think, that today that the clean energy and climate change bill was introduced in the United States Senate. And this project is consistent with the goals of that bill, which I've been working very hard for, which is reducing greenhouse gas emissions overall and using new sources of alternative energy to reduce our dependence on foreign oil for our nation's security and for Nevada's economic diversification especially.

So we support this project, I should say I support this project. And just as a matter of who I am personally, I'm an over 40-year resident of

0064-17

0064-18

0064-17
Biological Resources
The proposed project was based on many factors to mitigate impacts while maintaining an efficient site design.

0064-18
General
The proposed project was based on many factors to mitigate impacts while maintaining an efficient site design. The impacts to desert torotise will be specifically addressed by the final EIS and by the Biological Opinion issued by USFWS.

Nevada, graduate of UNR. I studied renewable natural resources up there. I also have a degree from UNLV so I'm both sides of the state. But and I also reside in Henderson, Nevada, just right over here in Sun City Anthem, so I cover a whole lot of different demographics for you this evening.

But I just want to say this is an excellent project and thank you for the opportunity to speak on its behalf, or its support of it rather. Thank you.

KAREN LADD: Thank you. Are there any other folks who want to make a comment? Anyone who already spoke who wants to add anything to their previous comment?

With that I think we can conclude this portion.

GREG HELSETH: Sure. I'd like to remind everyone that Debbie is right up here in front, our court reporter, so if you'd like to make a comment where you didn't want to speak in front of everyone, you're more than welcome to pull a chair up and give her a comment or concern so that it gets entered into the record.

And again thank you for everyone showing up this evening. We are going to be here until 8:00 o'clock this evening. We'll be milling around the

0064-18 Continued

0064-18 cont'd
General
Your statement is included in the public record and will be taken into account by decision-makers when they consider the proposed project.

room so if you'd like to come up and talk to us about any particular issues, we welcome the input. And, Mark?

MARK CHANDLER: Also, as Greg said, we are going to be here until 8:00 o'clock. We do have specialists in the office. If you guys could stand up in the audience here. Our recreation specialist, Bob, stand up there, buddy; Jason Barangan, our wildlife person; Gayle Marrs-Smith, she's going to be our future Pahrump Field Office manager but she's currently our assistant field manager for resources and botany and social economics.

And next to her standing up is Lisa Christianson, who is our air quality specialist. And in front in the black is Meghan, who is our hydrologist. And behind her standing there is Chato Posson, who is our land law examiner. And standing next to her is Brenda Wilheight, who is also a realty specialist. And Michele, she's not a specialist but she's pretty special -- somebody is going to yell at me for whispering -- and Michele Bilodeau, who is our environmental planner coordinator; Bob Ross, who's the Las Vegas Field Officer manager and decision maker. And back here is Mary Jo Rugwell, who's our district manager. Anybody else sneak in the back

row, hide in the back row? So with that we're done.

GREG HELSETH: We're not done. We're here until 8:00.

(Thereupon the proceedings were concluded at 8:00 p.m.)

* * * * *

CERTIFICATE OF REPORTER

STATE OF NEVADA)

SS:

COUNTY OF NYE)

I, Deborah Ann Hines, certified court reporter, do hereby certify that I took down in shorthand (Stenotype) all of the proceedings had in the before-entitled matter at the time and place indicated; and that thereafter said shorthand notes were transcribed into typewriting at and under my direction and supervision and the foregoing transcript constitutes a full, true and accurate record of the proceedings had.

IN WITNESS WHEREOF, I have hereunto affixed my hand this _____ day of _____, 2010.

_____

Deborah Ann Hines, CCR #473, RPR

SILVER STATE SOLAR PROJECT

DRAFT ENVIRONMENTAL IMPACT STATEMENT SCOPING MEETING

REPORTER'S TRANSCRIPT OF PROCEEDINGS

On Thursday, May 13, 2010

At 6:00 p.m.

At the Gold Strike Casino

1 Main Street

Jean, Nevada

Reported by: Deborah Ann Hines, CCR #473, RPR

KAREN LADD: Good evening, ladies and gentlemen. If I can give you a reminder to turn your cell phones off, we'd appreciate that.

We're here tonight -- I'm sorry for the scratchy voice -- we're here tonight to hear your comments on the Draft Environmental Impact Statement for the Silver State Solar Project that has been proposed by NextLight Renewable Power. And I'm going to introduce you to the panel here and then we're going to open it up and take your comments.

Right here is Howard Levine with the -- I'm sorry, I forgot to introduce myself. I'm Karen Ladd with Ecology & Environment and I'll be moderating the meeting tonight. This is Howard Levine with Ecology & Environment. It's the third-party environmental consultant who's conducting the environmental impact statement for the project and Bureau of Land Management. And Howard is going to say a few words about the project and about the environmental review process.

Seated next to him is Mike Hatfield, who is with NextLight, and he'll say a few words about the project. His company is proposing the project here. And seated next to him is Mark Chandler, who is a realty specialist with the Bureau of Land Management.

And seated next to him is Greg Helseth who is the renewable project manager for the project. And the Bureau of Land Management is being asked to decide whether to issue a right-of-way grant for this project so they will speak to that issue.

After we get done saying some of these introductory comments, I'm going to open it up to hear your comments. I have one person who has registered to give comments and I'll call on him first and I'll give him three minutes to give his comments and then I'll open it up for anyone else who wants to give comments and we'll go from there.

HOWARD LEVINE: Thank you, Karen. Again my name is Howard Levine. I'm the project manager for Ecology & Environment, a consulting firm to prepare the Environmental Impact Statement for this project. We'd basically be an extension of the government's staff because they're getting a lot of work these days. These projects are being contracted out to third parties such as us and paid for by the proponent, so it's not paid for by the taxpayers' money.

We started this project, this EIS project, last summer with the Notice of Intent to prepare an EIS. And at that point there was a 30-day scoping

period that was extended quite a few days to the middle of October. And at that point that's when the public was told about the project, the proposed project, and given the opportunity to have a meeting like this and for us to come out here and hear your comments and concerns about the project like this on the public lands.

Over the next few months working with the BLM, we developed three alternatives. One is the no action alternative, which is required under the National Environmental Policy Act for all federal EISs, and then two action alternatives: The proposed action by the proponent and another alternative that sort of evolved after the proposal was first submitted. So all three of those are analyzed in the Environmental Impact Statement, the EIS as it's called.

And we've done an impact assessment on all of those alternatives on the social impacts, the economic impacts, environmental impacts, cultural, and we released that document with a Notice of Availability in the Federal Register on April 16th for a 45-day comment period, and we're in the middle of that period right now.

That comment period ends June 1st, so all

comments have to be submitted, or at least postmarked, by June 1st. And the literature that's around here in the publication will tell you how to submit comments if you don't want to make written comments after today.

We'll take those comments and we'll revise the Environmental Impact Statement and prepare a Final Environmental Impact Statement. And we're looking at around middle of August or so for a Final Environmental Impact Statement to be circulated for a 30-day review period.

After that there will be a Record of Decision signed by the government deciding on whether or not to issue this right-of-way grant and what mitigation, what protective measures they would place on the right-of-way grant and on the developer should they approve the project.

The issues that were and the resources that were considered in the EIS, and I won't go into them in detail right here, but generally it was the impacts to soil, water, visual resources, recreation, threatened and endangered species and potential cumulative impacts given that this is only one of many projects that's located in this area, and cumulatively that could cause a pretty significant

impact with this project and other projects. So the EIS contains a pretty detailed discussion of how these impacts would collectively be creating other impacts beyond just what this project would.

That sums up what I have to say. I believe that Greg Helseth, on my left side here, who's the project manager for BLM, has a few words to say. Thank you.

GREG HELSETH: Thank you very much, Howard. Thank you, everyone, for showing up this evening. It looks like a nice turnout. Thank you for taking time out of your schedules to be here this evening. My name is Greg Helseth. I'm the renewable energy project manager for Southern Nevada. This is just one of our projects that we have currently in process for an application to do some renewable energy near the Primm area.

We have a team at the BLM who collects the information and puts this together in the Draft Environmental Impact Statement, which is what we're here this evening to talk about. And then from here we'll take your comments and form those into what's known as the Final Environmental Impact Statement and then there will be a decision on that document on one of the alternatives, either the no action or the

other two action alternatives moving forward, then that would then carry into a possible grant, right-of-way grant. And then from there the company would need to get some other permits from the county and stuff like that if it was a favorable decision for them and then they would start doing some construction.

So my team at the BLM is basically we're the collectors of the information and correlate it, make sure that we get everything right, cross all the Ts, dot all the I's and pass it up to management for an actual decision.

So again thank you, everyone, for showing up this evening. After your comments we'll still be here until 8:00 o'clock this evening and I welcome anyone to come up and talk to me about this project or any other interests you may have with the BLM's ongoing continuing projects.

Mark Chandler here to my right is a realty specialist on the team. Did you want to say something, Mark?

MARK CHANDLER: As he said, I'm Mark Chandler, realty specialist. And again your comments are really, really important to us tonight. Imagine, you know, we've been with this since the summer of

2009 and we've read the plan of development and draft copies of the EIS two or three times so it's kind of like, you know, listening to your kids in the background, it's kind of white noise. And so your eyes, your view of this document, you get that onetime look at that, you say, oh, wait a minute, they didn't dot this I or cross this T or maybe you need to read, you know, flush this out a little bit more for us so that we can understand it, and that's why we're hoping you can give us some really good comments tonight, the professionals here.

You know, if you turned in your cards there or if you're a little shy and you don't want to talk in public, this nice lady right here will, you know, you can pull up a chair and talk to her directly or you can send us an email. I'm usually the one responding to the emails late at night. And look forward to the next hour of your talking to us, and I'll turn it over to Mike.

MIKE HATFIELD: Thank you. I'd like to thank all of you as well. I'm Mike Hatfield with NextLight Renewable Power. We develop utilities, large scale solar projects in the west and we're proposing this project here in Southern Nevada.

We've been at it for several years now and

we've had the opportunity to talk to lots of folks. I see a few familiar faces in the audience and a few new faces. I'd like to encourage you to come up and talk to me afterwards. We have members of our team here as well available to answer your questions.

This is the BLM's show so this is their document and we're providing input to it, but I'd like to also say we really appreciate the very hard work of the BLM and its team in getting the project to this stage, so thank very much.

KAREN LADD: So with that now we'll open it up for public comment. And I just want to point out that tonight is not your only opportunity to provide comments. You can also send written comments, as Howard said, by June 1st. That's the end of the comment period.

And at the registration table we have comment forms like this which you're welcome to use. They have the address where you can mail them, or you can just send on your own paper. We'll take any comment that you want. We'll take them any way you send them.

Tonight the purpose of the meeting is to hear your comments, so we won't be answering any questions during this part of the meeting. But as

Greg said, when we finish the comment session, we will be here until 8:00 and there will be plenty of folks on hand to talk to you one-on-one about any of your interests.

So the court reporter here is recording comments so we have them as part of the public record and so when I call on you, if you would please say your name and spell your last name, we'd appreciate that. And the first commenter that I have is Chris Wile.

CHRIS WILE: Chris Wile, W-i-l-e. I represent IBEW Local 357 Las Vegas. We have 4,000, approximately 4,000 members. And in the state of Nevada we have a tremendous renewable energy source here, and I think we ought to utilize this.

We also -- not only do we talk about solar and renewable energy but we also have a training facility where we have solar panels on top of the roof as well as a wind generator. So we're not just talking about this stuff, we are renewable energy.

We also have classes at our apprenticeship where we teach people how to do the photovoltaic stuff as well as help with OSHA has a test they give for an installer in order to install the photovoltaic panels, you have to have a solar certification. We

0065-1

0065-1
General
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0065-1 Continued

have classes on that.

And I would just like to thank NextLight. Seems like they've made some concessions in some of the things they had before and what they've brought to the table now and so I think that they're trying to do what's best for everybody. I'm in support of this project.

KAREN LADD: That was the only person that had registered to give comments but I know a few of you indicated you might want to speak. Is there anyone who has decided that they'd like to give a comment? State your name and spell your last name.

0065-2

DON REID: Don Reid, R-e-i-d, resident of Nevada. I would like to speak out in favor of this project and others like it and why. One, it provides needed construction jobs; and two, it's an important step towards energy independence; and three, it's a source of clean, renewable, domestic energy. Thank you.

KAREN LADD: Thanks. Would anyone else like to make a comment?

SINISHA MANDICH: My name is Sinisha Mandich, M-a-n-d-i-c-h. I'm a member of IBEW Local 357 and I'm also an instructor at the IBEW JATC in Las Vegas. Chris is actually one of my bosses. And

0065-3

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General
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0065-2
General
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0065-3
General
Your statement is included in the public record and will be taken into account by decision-makers when they consider the proposed project.

0065-3 Continued

I'd like to speak in favor for the project.

Currently I am involved with a few other people over here at the Copper Mountain solar project, First Solar. Honestly I think that Nevada, as you all know, has a lot of potential for green energy projects, solar and especially wind that is untapped yet. And as a member of the labor force, I'm in favor of this. Thank you.

KAREN LADD: Would anyone else like to make a comment?

0065-4

WALTER MARTIN: My name is Walter Martin. I was worried about the project but after I talked to the gentleman in the thing, he says that the panels are going to be manufactured in the United States, which I'm for. I'm sick and tired of shipping it in from China and nothing is shipping out. And so this is why I'm present.

I'm also a 60-year retired member of Local 357 and I'm glad to see the project in Nevada. I wished it was in the center of Nevada, not on the California line. Thank you.

ROGER PEEPLES: Looks like IBEW is going to be here for all the comments. I'm Roger Peeples, P-e-e-p-l-e-s, and like a bunch of other members of the hall here, I hold a PE card. And this work, we'd

0065-5

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General
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0065-4
General
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0065-5
General
Your statement is included in the public record and will be taken into account by decision-makers when they consider the proposed project.

0065-5 Continued

like to see it press forward, not just the solar part but I'd like to see wind come in as well as we have a lot of geothermal.

There's a lot of stuff here that I don't think the people even live here understand what's right under our feet and not just over our head. There's all kinds of resources here that's totally untapped, completely untapped.

And if you want to see what these panels look like, drive out towards Boulder City, turn over and go, head out towards California there, towards Searchlight, and you can see this project.

And one of my daughters is working on it right now. For the first set, the one out there, I was the foreman on that job. We did 750 connected to the grid, and we're really involved with this. You're not talking to people who haven't been there and done that, we've been there done, we've done that. I've probably put in some of the first solar panels here in the state. It was for the railroad, and unfortunately it only lasted two weeks, but that was back in the '60s, you know.

And I've got a lot of history here. I have seven kids here. I want to stay here. I want to make sure the project goes in right. I want to make

0065-5 cont'd
General
Your statement is included in the public record and will be taken into account by decision-makers when they consider the proposed project.

0065-5
Continued

sure it goes in with good labor. I want to make sure it's maintained properly and I want to make sure it isn't abandoned and I want to make sure everything is kept up and going. I live here. My grandkids live here. And that kind of puts it where it's supposed to be. And of course I'm a hundred percent for this project.

KAREN LADD: Would anyone else like to make a comment? Thank you all. We appreciate your comments. I'll turn it over to Greg now.

GREG HELSETH: All right. As I mentioned, we will be here until 8:00 o'clock this evening. If you'd like to talk with any one of us from the BLM or from NextLight, we're always available.

We have BLM members in the audience also. We have Bob Ross here, who's our field manager for the Las Vegas Field Office. Right next to him is Lisa Christianson. Lisa is our air quality specialist. Over here we have Michele Bilodeau, she's our environmental coordinator. And of course myself and Mark are with the BLM. And then we have several people throughout the area here that are either from NextLight or from E&E.

So with that being said, we'll go ahead and end this portion and we'll welcome anybody who wants

0065-5 cont'd
General
Your statement is included in the public record and will be taken into account by decision-makers when they consider the proposed project.

to come up and talk to Debbie. She's pretty easy to talk to. So all right, thank you very much.

WAYNE WALTERS: Wayne Walters. I like the idea of their project only I'd like it to be larger, supply not only Nevada but also California, since it is that close to the border, something similar in capacity as big as the one in Yermo, which is about I think 20 acres or more, actually bigger than the one depicted here. 0065-6

And I would like to see something on the other side of the mountains also towards, I don't know if you can do it in Death Valley or not where it's really warm and the sun shines a whole lot, quite a bit.

My place is across the mountain. I live in Sandy Valley, which is 60 miles as the bird flies from Death Valley on the California side and I'd like to see something over there also. I like the idea of the project. I wish it was on a larger scale to reduce dependence on oil and stuff and everything. You know, it's cleaner for the environment and maybe it could include like wind turbines, and that's all I have to say.

(Thereupon the proceedings were concluded at 8:00 p.m.)

0065-6
General
Your statement is included in the public record and will be taken into account by decision-makers when they consider the proposed project.

CERTIFICATE OF REPORTER

STATE OF NEVADA)

SS:

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I, Deborah Ann Hines, certified court reporter, do hereby certify that I took down in shorthand (Stenotype) all of the proceedings had in the before-entitled matter at the time and place indicated; and that thereafter said shorthand notes were transcribed into typewriting at and under my direction and supervision and the foregoing transcript constitutes a full, true and accurate record of the proceedings had.

IN WITNESS WHEREOF, I have hereunto affixed my hand this _____ day of _____, 2010.

_____

Deborah Ann Hines, CCR #473, RPR

SILVER STATE SOLAR PROJECT

DRAFT ENVIRONMENTAL IMPACT STATEMENT SCOPING MEETING

REPORTER'S TRANSCRIPT OF PROCEEDINGS

On Tuesday, May 11, 2010

At 6:00 p.m.

At the Primm Valley Resort

31900 Las Vegas Boulevard South

Primm, Nevada

Reported by: Deborah Ann Hines, CCR #473, RPR

KAREN LADD: Good evening, everyone. If I can give you a gentle reminder to turn off your cell phones, we'd appreciate that.

So we're here tonight to hear your comments on the Silver State Solar Project for which a Draft Environmental Impact Statement has been prepared. And my name is Karen Ladd and I'll be moderating the meeting tonight.

I'm going to introduce you to the panel, and after that if we have folks who want to give comments, I'll invite you up to do that. Right now I don't have anybody signed up to make a comment but if you'd like to, at the registration table we have a list that you can put your name on and I'll call you up to speak.

This meeting is to hear your comments. We'll give some brief introductory remarks, but the bulk of the meeting is going to be devoted to hearing your comments.

At the panel here we have several folks. This is Mike Hatfield with NextLight Renewable Power. This is the proponent of the project. Seated next to him is Howard Levine, who's with Ecology & Environment. Ecology & Environment is also known as E&E. It's the third-party environmental consultant

assisting the BLM in preparing the Environmental Impact Statement, and Howard will give some introductory remarks about E&E's role in the process.

And next to him is Greg Helseth, who is the project manager with the Bureau of Land Management. And the Bureau of Land Management has been asked to determine whether to issue a right-of-way grant for this project, and so they have decisions to make. And seated next to him is Mark Chandler, also with the BLM, who is with lands and realty. And I'm going to turn it over to them right now starting with Howard, who's going to give E&E's role in the process.

HOWARD LEVINE: Yes, I am. Thank you, Karen. As Karen said, I'm with Ecology & Environment. I'm the project manager for this project preparing the Environmental Impact Statement. We were hired by BLM to prepare this document.

Our role basically is to sort of extend BLM's workforce, since they have so much work on their plate they need to get help from the private sector, and they work with consultants like ourselves and NextLight pays the bill. Thank you.

Just briefly let me just talk about the NEPA process and a few words about the EIS, just to give

us a common understanding of where we've been and where we're going and where we are today. Last summer we had three scoping meetings. One of them was right here. That was basically to listen to the public to identify issues that were of concern to them after hearing about the project and getting a sense of what that would entail. We had three meetings that had quite a few comments that came out of that.

From that period we developed alternatives. Three alternatives came up that we carried forward in the EIS: The no action alternative, that's if no right-of-way was issued to NextLight, what would happen to the environment from that point of view, and then two action alternatives. And there's a poster over there on the left hand, my left, your right, on what the two different alternatives look like. Primarily there's some changes in the flood control system and some minor modifications of where the solar arrays go. Still both projects are 400 megawatts.

Right now as part of the EIS we did an impact assessment, I'll talk in a few minutes from now what those impacts potentially -- what the findings were of those potential impacts. Right now

we're in a 45 minute -- 45 day, seems like 45 minutes, comment period by the public. The Notice of Availability for the EIS was published in the Federal Register on April 16th and the comments must be postmarked by June 1st. And this is the time that the public can review the document and provide comments back to BLM, and those will be reviewed and the document will be revised based on those substantive comments. We're expecting the Final Environmental Impact Statement to be released later in the summer, July, August period, with a Record of Decision following in September.

Just a few words about the findings. I know you've probably read the EIS, you've gone to chapter four, seen the environmental consequences, absorbed what those findings were across the three alternatives. Just briefly the potential for impacts are soil erosion, water and overland flooding that would impact water quality, as well as increased soil erosion down slope.

There would be a loss of vegetation where the solar arrays go and the other infrastructure would be. There would be a loss of habitat, both for just garden variety animals as well as threatened and endangered species, although there's no critical

habitat there. There will be displacement of some of those animals outside of the fenced area where the project would -- where the arrays would be.

There would be a visual impact with 2900 acres of solar arrays across the desert, they would be seen, and then there would be possible cumulative impacts from this project along with several others that are either planned for or have been developed already in the Primm Valley.

So that's just a very brief overview of the project where we are. This meeting, as Karen said, is to hear the public's input and comments. And we'll be out here afterwards. If you have questions we can talk about it but right now this is just the time for comments, all right?

Greg?

GREG HELSETH: Thank you very much, Howard. I'd like to thank everyone for showing up this evening. Thank you. I'm Greg. I'm with the BLM. I'm the renewable energy project manager. Mark Chandler here is on our team and we have some other BLM folks out in the audience, if you'd like to talk with us after the meeting.

I'd ask that if you're going to give us a comment, please state your name and last name for the

record spelling your last name please so that Debbie, our court reporter, can take that down and make sure that your comment gets put into the federal record. With that I guess we can start the meeting.

Mark, do you want to have anything to say?

MARK CHANDLER: Oh, sure.

GREG HELSETH: Here's Mark.

MARK CHANDLER: Look forward to hearing your comments tonight. My brief comment is, you know, we get to read this document probably four or five times and sometimes we miss things. And so it's hopeful -- I look forward to your comments to see things we might have missed having read it four or five times, we might have missed it. It's so glaring to you but to us it's like, oh, I missed that, thank you for pointing it out. So it's not that we might have ignored it, it's just that we've seen it so many times and it helps to have a nice, fresh view from the public. So look forward to hearing those things. Thank you.

GREG HELSETH: All right, Karen, it's all yours. Thank you.

KAREN LADD: So tonight we're here to hear your comments. And if you'd like to give me a comment, or, excuse me, give the panel a comment,

just let me know. I currently don't have anybody signed up to speak.

I will point out that tonight is not your only opportunity to make comments. Tonight is the first of three meetings that will be held. Tomorrow is in Las Vegas at the M Hotel, and on Thursday evening, same time, it's in Jean at the Gold Strike.

And in addition to these three public meetings, you're welcome to submit written comments. We've got some comment forms that you're welcome to use, they're at the registration table, and we have some here at the table. They've got the address and the email address where comments can be sent. And as Howard mentioned, comments are due by June 1st. And can I ask, does anybody want to give a comment?

JOHN TULL: So we don't have a shutout, I'll give a comment.

KAREN LADD: If you would please state your name and spell your last name.

JOHN TULL: John Tull, T-u-l-l, and I'm with the Nevada Wilderness Project. A good part of our work these days is on renewable energy projects, in particular fast track projects in the state. So we've been trying to meet with proponents of these various projects and we were able to start

0066-1

0066-1
General
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0066-2

conversations last year with NextLight.

The only comment I have is really that they've been I think sort of a model for how we hope to see these development programs continue in the future. They've listened to our concerns, the environmental community in general, and, you know, we hope that this pattern will, or at least this project will set a good demonstration of how to move forward in the future. And then I'll save all the comments I have for the BLM for the written stuff. Thanks.

KAREN LADD: So as Howard said, the comments that are submitted during the comment period are included as part of the Final EIS and they'll be addressed and responses will be provided within the EIS, so we encourage you to provide those comments if you'd like.

State your name and spell your last name please.

SCOTT RUTLEDGE: Yeah, Scott Rutledge, R-u-t-l-e-d-g-e. I'm with the Nevada Conservation League, and I just want to echo John's comments. We've been meeting with NextLight for over a year now. Their project fairly has been open to numerous meetings with the environmental community and have been listening to concerns. It's been a really good

0066-3

0066-2
General
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0066-3
General
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experience so I do hope this is a model for the way the rest of these projects go forward.

We don't offer a lot of technical expertise on these issues, we rely on the broader community, so we sort of serve as a liaison between the groups that may not have staff but just board members or volunteers and we give them an opportunity with NextLight's support to sit down and have a number of opportunities outside of these public meetings but really just to sit down and talk about some of the issues. And it's been a really productive process so thanks again to NextLight and their project team. Hopefully we'll see this project move forward with very little concern. 0066-3 Continued

KAREN LADD: Do we have any others who would like to make a comment tonight?

EDWARD GERING: My name is Edward Gering, G-e-r-i-n-g, and I would just like to express our enthusiasm for this project. We have worked with NextLight, as was stated, in a project that's currently being put in Copper Mountain in the Boulder City area. 0066-4

We look forward to providing the project with highly trained, skilled workmen who are from the community and the surrounding areas and hope that we

0066-3 cont'd
General
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0066-4
General
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0066-4 Continued

can continue the very productive and very amiable relationship that we've had and look forward to having an impact and input and a part in the upcoming project. So thank you very much.

KAREN LADD: So do we have anyone else who would like to make a comment?

Well, I think we'll call the meeting to a close. The folks, as Greg said, from NextLight, there's several folks here if anybody had any comments or questions about the project, they're available to answer questions, and the BLM representatives and E&E are on hand as well.

GREG HELSETH: We'll actually be here until 8:00 o'clock this evening for anyone who would like to speak with any one of us. Mike is going to say something.

MIKE HATFIELD: I wanted to introduce myself, Mike Hatfield with NextLight, the project proponent. Thank you for that introduction, Karen.

I think we would just like to thank the BLM and their team for all of the incredibly hard work they have done to make sure this process goes, this project goes through the NEPA process thoroughly, and we look forward to continuing to work with you, so thank you.

0066-4 cont'd
General
Your statement is included in the public record and will be taken into account by decision-makers when they consider the proposed project.

GREG HELSETH: Thank you.

KAREN LADD: As Greg said, we'll be here until 8:00.

(Thereupon the proceedings were concluded at 8:00 p.m.)

* * * * *

CERTIFICATE OF REPORTER

STATE OF NEVADA)
SS:
COUNTY OF NYE)

I, Deborah Ann Hines, certified court reporter, do hereby certify that I took down in shorthand (Stenotype) all of the proceedings had in the before-entitled matter at the time and place indicated; and that thereafter said shorthand notes were transcribed into typewriting at and under my direction and supervision and the foregoing transcript constitutes a full, true and accurate record of the proceedings had.

IN WITNESS WHEREOF, I have hereunto affixed my hand this _____ day of _____, 2010.

_____
Deborah Ann Hines, CCR #473, RPR

California Office
1303 J Street, Suite 270 | Sacramento, CA 95814 | tel 916.313.5800 | fax 916.313.5812
www.defenders.org

June 1, 2010

Gregory Helseth, Renewable Energy Project Manager
Pahrump Field Office
Bureau of Land Management
4701 N. Torrey Pines Drive
Las Vegas, NV 89130

via email to: Gregory_Helseth@blm.gov

Re: Comments on the Draft Environmental Impact Statement for the NextLight Renewable Power, LLC, Silver State Solar Project, Primm, NV (FR, 4/16/10, pp. 19990-91)

Dear Mr. Helseth:

Thank you for the opportunity to submit comments on the Draft Environmental Impact Statement (DEIS) for the proposed Silver State Solar Energy Project. These comments are submitted on behalf of Defenders of Wildlife ("Defenders"), a non-profit public interest conservation organization with over 1,000,000 members and supporters nationally, 200,000 of whom are in California.

Defenders is dedicated to protecting wild animals and plants in their natural communities. To achieve this end, Defenders employs science, public education and participation, media, legislative advocacy, litigation, and proactive on-the-ground solutions in order to impede the accelerating rate of extinction of species, associated loss of biological diversity, and habitat alteration and destruction. Defenders submitted issue scoping comments for the proposed project on July 30, 2009.

As we transition toward a clean energy future, it is imperative for our future and the future of our wild places and wildlife that we strike a balance between addressing the near-term impact of large scale solar development with the long-term impacts of climate change on our biological diversity, fish and wildlife habitat, and natural landscapes. To ensure that the proper balance is achieved, we need smart planning for renewable power that avoids and minimizes adverse impacts on wildlife and wild lands.

We strongly support renewable energy production and utilization, but we do not consider the construction of large-scale projects, and especially the very large solar energy projects proposed on public lands throughout southern Nevada and the adjacent California Desert Conservation Area, to be the primary way to meet our renewable energy goals. We believe such large scale solar projects must be located on degraded or disturbed land such as abandoned agricultural fields, industrial sites, and near existing structures before public lands containing natural plant and animal communities are considered.

The proposed project would entail the exclusive use of approximately 3,000 acres of public land for the construction, operation, and eventual decommissioning of a 400 MW rated electrical energy

National Headquarters
1130 17th Street, N.W.
Washington, D.C. 20036-4604
tel 202.682.9400 | fax 202.682.1331

generation facility utilizing photovoltaic panel technology. The site of the proposed project is located in Ivanpah Valley and east of Primm, NV and Ivanpah Dry Lake.

Our comments on the DEIS are as follows, arranged by subject:

I. NEPA

Purpose and Need: The range of alternatives analysis is "the heart of the environmental impact statement." 40 C.F.R. § 1502.14. The National Environmental Policy Act ("NEPA") requires BLM to "rigorously explore and objectively evaluate" a range of alternatives to proposed federal actions." *See* 40 C.F.R. §§ 1502.14(a) and 1508.25(c). In specifying their EIS obligations under NEPA, federal agencies must "specify the underlying purpose and need to which the agency is responding in proposing the alternatives including the proposed action." 40 C.F.R. § 1502.13. Agencies may not "contrive a purpose so slender as to define competing 'reasonable alternatives' out of consideration (and even out of existence)." *Simmons v. U.S. Army Corps of Eng'rs*, 120 F.3d 664, 665 (7th Cir. 1997). Nor may agencies "define the objectives of its action in terms so unreasonably narrow that only one alternative . . . would accomplish the goals of the agency's action, and the EIS would become a foreordained formality." *Citizens Against Burlington v. Busey*, 938 F.2d 190, 196 (D.C. Cir. 1991) cert. denied 503 U.S. 994 (1991).

BLM Purpose and Need: According to the DEIS, the stated purpose of the proposed project is to "…consider a ROW grant application to construct, operate, maintain, and decommission a solar energy project on public lands administered by the BLM." The need for the project is described as "...to respond to the application under Title V of FLPMA for a ROW grant to construct, operate, maintain, and decommission a solar PV facility on BLM lands." Furthermore, the DEIS also describes the need for the project as "…BLM is acting under the requirements of federal mandates that encourage the use of public lands for renewable energy development. Additionally, the BLM has considered how the Proposed Action fits the region's overall energy market, including economic viability, proximity to energy consumers, and transmission line capacity and reliability factors." (DEIS at 1-1 through 1-2)

Comment: Rather than presenting a purpose and need statement that reflects the larger goal of providing for the development of solar energy, and then evaluating different means to achieve that goal, the BLM has instead defined the its purpose and need simply to process the applicant's right of way application. By so radically narrowing the scope of the project's purpose, BLM has impermissibly constricted the range of alternatives considered. *See Carmel by the Sea v. U.S. DOT*, 123 F.3d 1142, 1155 (9th Cir. 1995). 0067-1

On page 1-4 of the DEIS are a list of mandates that BLM considers applicable in its consideration of the right of way application for the proposed project. Among those is reference to the Energy Policy Act of 2005, Section 211. BLM describes it as mandating the Secretary to approve at least 10,000 MW of non-hydro power renewable energy projects on public lands by 2015.

Comment: Please clarify that the BLM is not mandated to approve the stated minimum amount of electrical energy from public lands. The law *encourages* the Secretary of the Interior to authorize use of public lands for the specified power generation. If the law mandated the stated generation of power, BLM would essentially have no other choice but to approve projects under a Congressional 0067-2

0067-1
Purpose and Need
Many factors were used in development of the purpose and need for the project. First, BLM is obligated to respond to a valid right of way application filed on lands that are open under the public land laws. Second, BLM considered several federal mandates to promote renewable energy on its lands, including the Energy Policy Act of 2005 and several presidential executive orders. The applicant has considered other sites to build solar energy projects, some of which are being pursued on both public and private lands throughout the West. Finally, the purpose and need for the project allowed a reasonable range of alternatives which were driven by the analysis and feasibility.

0067-2
Alternatives
Sec. 211 of the Energy Policy Act of 2005 reads: It is the sense of the Congress that the Secretary of the Interior should, before the end of the 10-year period beginning on the date of enactment of this Act, seek to have approved non-hydropower renewable energy projects located on the public lands with a generation capacity of at least 10,000 megawatts of electricity. We believe BLM's consideration of the application is consistent with the sense of Congress.

mandate. But, BLM clearly has discretion whether or not to issue rights of way for any proposed project on public lands.

Also on page 1-4 is this statement about the purpose of the DEIS, "BLM will use this EIS to analyze terms, conditions, and mitigation to determine, which, if any, modifications to the Proposed Project are effective and would protect other resource values.

Comment: We are troubled that BLM so narrowly views the purposes of NEPA process and the environmental impact statement with regard to proposed federal actions. We are concerned that this narrow view has inappropriately constrained the identification, consideration and analysis of a reasonable range of alternatives that would achieve the purposes and need for the federal action. Indeed, the range of alternatives considered and analyzed is so narrow that the only action analyzed is essentially what the applicant has proposed. 0067-3

Comment: BLM must objectively analyze a range of alternatives, including no action, that are designed to avoid and minimize significant impacts to the human environment while still achieving the basic purposes of the proposed action or project. Alternate locations, smaller project sizes, and various technologies should be included in the analysis. 0067-4

Project Alternatives: In addition to properly defining the purpose and need of an agency action, agencies must consider a range of reasonable alternatives to the agency action in the EIS. *See* 42 U.S.C. § 4332(2)(E). The purpose of this requirement is "to insist that no major federal project should be undertaken without intense consideration of other more ecologically sound courses of action, including shelving the entire project, or of accomplishing the same result by entirely different means." *Environmental Defense Fund v. Cops of Engineers*, 492 F.2d 1123, 1135 (5th Cir. 1974); *Methow Valley Citizens Council v. Regional Forester*, 833 F.2d 810 (9th Cir. 1987), rev'd on other grounds, 490 U.S. 332 (1989) (agency must consider alternative sites for a project). The BLM analyzed three: No action, the proposed action and a modification of the proposed action. The failure to provide meaningful alternatives violates NEPA. Considering the significant impact that the proposed project and alternative would have on the Desert Tortoise and its habitat, NEPA requires that alternatives be developed and analyzed that would minimize impacts to this federal threatened species. 0067-5

Such a truncated alternatives analysis violates the agency's duty under NEPA to fully review "all reasonable alternatives." The EIS must analyze project alternatives including: (1) site alternatives, including development on private lands and (2) alternative technologies. 0067-6

BLM appears to have severely limited consideration of what constitutes a reasonable alternative by adopting essentially only considering alternatives that conform to the desires of the project applicant. In fact, BLM identified the applicant's proposed project as its preferred alternative. This is very troubling. The rationale for including Alternative 3 in the analysis is puzzling. Alternative 3 is essentially Alternative 2 plus 1,100 acres of additional disturbance associated with drainage control developments: debris and detention basins, diversion channels, and berms. There is no justification given for this alternative. It wasn't proposed by the applicant, and BLM's preferred alternative is the applicant's proposal. 0067-7

Comment: Justification for Alternative 3 should be given. If unjustified then it should be eliminated from consideration in the DEIS. 0067-8

0067-3
Purpose and Need
Many factors were used in development of the purpose and need for the project. First, BLM is obligated to respond to a valid right of way application filed on lands that are open under the public land laws. Second, BLM considered several federal mandates to promote renewable energy on its lands, including the Energy Policy Act of 2005 and several presidential executive orders. The applicant has considered other sites to build solar energy projects, some of which are being pursued on both public and private lands throughout the West. Finally, the purpose and need for the project allowed a reasonable range of alternatives which were driven by the analysis and feasibility.

0067-4
Alternatives
BLM considered a reasonable range of alternatives consistent with NEPA and BLM policies and procedures. The two action alternatives satisfy the purpose and need in that they fulfill BLM's obligation to consider the ROW application, meet federal renewable energy mandates and respond to impacts identified in the NEPA analysis.

0067-5
Alternatives
The EIS did consider the impacts to all affected resources and identified all reasonable mitigation to reduce or avoid impacts.

0067-6
Alternatives
The EIS considered all reasonable alternatives and eliminated those alternatives that were either outside the scope of the purpose and need or were considered infeasible.

0067-7
Alternatives
BLM did consider all reasonable alternatives to the proposal submitted by the applicant. For example, the analysis eliminated concentrating solar (thermal) power because it was believed that the project would require excessive amounts of water during operations.

0067-8
Alternatives
Alternative 3 essentially contains the proponent's original stormwater control design. During the analysis, the proponent developed a second design that would involve less land (Alternative

2). Both alternatives were brought forward for analysis because they met the purpose and need and were feasible.

On page 2-2 of the DEIS, the following statement is made regarding the no action alternative: "The No Action Alternative assumes that the right-of-way (ROW) application is denied and the Proposed Project is not built. Under this alternative, the purpose and need for the Proposed Action would be provided by other means." It appears BLM considers the no action alternative would achieve the same purpose and need for the proposed action. This alternative appears to have significant merit in that it would avoid the substantial adverse impacts to the Desert Tortoise and its habitat. This alternative would apparently allow BLM to fully comply with its Special Status Species Management Policy in Manual 6840. 0067-9

Comment: The no action alternative and the means by which the purpose and need for the project would be met needs to be fully described and analyzed, including how it would allow BLM to achieve its management policy for species listed under the Endangered Species Act on public lands within the proposed project area. 0067-10

The DEIS contains the following statement regarding consideration of alternatives to the proposed action that would include a smaller-sized project: "No comments were received during scoping suggesting that the Proposed Project should have a smaller footprint or should be reduced in capacity."

Comment: Defenders disagrees with the above statement. On the contrary, we submitted the following recommendation in our issue scoping letter for the proposed project in a letter dated 7/30/09: 0067-11

> *Defenders urge the BLM to be creative and open-minded in establishing a range of reasonable alternatives that would include the following:*
>
> - *Different locations, not limited to those in Nevada, which would entail the use of previously degraded land, such as abandoned agricultural fields and industrial sites, even if not under BLM jurisdiction. The BLM and project proponent should pursue potential opportunities for the use of such lands as part of their obligation under NEPA. Furthermore, because of the unprecedented large size of the projects, failure to vigorously pursue, indentify and analyze alternative locations using previously degraded land may pose a legal and regulatory issue for BLM under the Federal Land Policy and Management Act, i.e., preventing the unnecessary and undue degradation of public lands.*
> - *Different locations that do not support BLM Special Status Species, such as the Desert Tortoise.*
> - *Reduced project size needs to be analyzed, such as locating it adjacent to Primm, even if that would entail use of private lands entirely or in part. For example one such alternative would be locating the project between the existing railway and I-15 rather than extending eastward to the western slope of the Lucy Grey Mountains.*

Comment: BLM should identify and evaluate alternatives to the proposed project, including those that are of different size, different technology and different location. Alternatives should include robust analysis of the potential adverse impacts from the proposed projects. BLM should not 0067-12

0067-9
Alternatives
The no action alternative does partially conform with the purpose and need for the project in that responds to a FLPMA Title V right of way application. It does not meet federal renewable mandates but does consider beneficial impacts to local wildlife populations.

0067-10
Alternatives
No action alternative does not fully meet the purpose and need for the project. It is a requirement of NEPA and considered impacts that would occur if BLM did not approve the proposed project or its alternative.

0067-11
Alternatives
The suggested wording has been included in the Final EIS.

0067-12
Alternatives
BLM considered a reasonable range of alternatives consistent with NEPA and BLM policies and procedures. The two action alternatives satisfy the purpose and need in that they fulfill BLM's obligation to consider the ROW application, meet federal renewable energy mandates and respond to impacts identified in the NEPA analysis.

preclude consideration and analysis of a private land alternative or any other alternative from analysis because it is not within the agency's jurisdiction. In fact, NEPA regulations require inclusion of reasonable alternatives not within the jurisdiction of the lead agency. 40 C.F.R. § 1502.14(c).

The proposed project and alternatives are all located on the bajada located between the town of Primm, NV and the adjacent Lucy Gray Mountains. It appears the most efficient use of public lands in this area for the proposed project has not been considered.

Comment: Public land closer to the existing railroad and private property adjacent to Primm should be considered as an alternative location that would allow reducing the amount of public land needed to support the project that is in a more natural condition. An alternative that reduces the proposed project encroachment onto the bajada between Primm and the slope of the Lucy Gray Mountains to the maximum extent possible needs to be identified and analyzed. 0067-13

Adequacy of the NEPA Analysis: The only species surveyed for on the proposed project area was the threatened Desert Tortoise. The DEIS stated that no formal botanical surveys or other wildlife surveys were done. Absent a description of the resources on the project area other than the Desert Tortoise, the description of the affected environment is deficient and, therefore the environmental consequences or impacts of the proposed project would also be incomplete. Species occurrences in the project area were speculative and based on potential occurrence that was not documented by site-specific survey or investigation.

Comment: The DEIS needs to be augmented with a draft supplemental DEIS that fully describes the affected environment and environmental consequences based on new on-site survey information collected for biological resources. 0067-14

Cumulative Impacts Analysis: Cumulative impact is defined as the impact on the environment which results from the incremental impacts of the action when added to other past, present, and reasonably foreseeable future action regardless of what agency or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time. 40 C.F.R. § 1508.7.

Comment: The cumulative effects of the existing and reasonably foreseeable projects within the Ivanpah Valley as a whole needs to be analyzed, especially with regard to the long-term viability of the Desert Tortoise and biological continuity with populations in designated critical habitat units in Nevada and California. The analysis in the DEIS identifies numerous and existing projects and activities occurring in the Ivanpah Valley region but does not offer an in-depth analysis of the condition and trend of biological resources based on cumulative impacts. Such an analysis needs to be done for all at-risk species including all BLM designated Sensitive Species and those federally proposed or listed. 0067-15

II. Climate Change

We applaud BLM for including information on the temperature changes predicted to occur within the Northern Hemisphere as a result of climate change in describing the affected environment.

0067-13
Alternatives
Sufficient public land was not available in the area suggested by the writer.

0067-14
Biological Resources
Your statement is included in the public record and will be taken into account by decision-makers when they consider the proposed project.

0067-15
Biology - Desert Tortoise
Section 4.19.6 Biological Resources The analysis of cumulative impacts to biological resources has been revised in the text of the FEIS.

More recent information on the warming effects of climate change is available from the U.S. Global Change Research Program.[1]

Comment: We recommend that BLM update the DEIS section on climate change by incorporating the latest scientific research from the members of the U.S. Global Change Research Program, the body responsible for integrating and coordinating federal research on climate change. Their latest scientific assessment indicates that "…global warming observed over the past 50 years is due primarily to human-induced emissions of heat-trapping gases." 0067-16

Comment: In addition to the information regarding the Council on Environmental Quality's draft guidance to federal agencies on dated February 18, 2010, we recommend directives contained in Secretarial Order 3226[2] be addressed. 0067-17

Comment: The DEIS should include an analysis of the effects of the proposed project discussion of the environmental consequences, cumulative effects and mitigation measures, including those associated with climate change.[3] The potential effects of the proposed project on biological resources adaptation to climate change, including habitat continuity to provide for species movement and habitat occupancy over time should be addressed. 0067-18

III. Water Resources

Water to support the construction of the proposed facility is estimated at 200 acre-feet per year (afy) for a period of four years, and 21 afy for operations and maintenance for the life of the project. The source of the water would be groundwater from Basin 164-A which would be obtained from new wells developed on-site. Rights to pump groundwater would be based on the purchase of existing rights held by the Las Vegas Valley Water District. (DEIS at page 2-35).

Comment: Water supply alternatives should be included in the analysis. Specifically, use of reclaimed water from the commercial facilities located at Primm, NV needs to be considered and analyzed. The condition and trend of the groundwater in the basin underlying the basin needs to be described and considered in the impact analysis. Furthermore, a cumulative impact analysis to the 0067-19

[1] U.S. Global Change Research Program. 2009. Global Climate Change Impacts in the United States. Thomas R. Karl, Jerry M. Melillo and Thomas C. Peterson eds.

[2] Secretarial Order 3226, *Evaluating Climate Change Impacts in Management Planning* § 4 (January 16, 2009) ("Each bureau and office of DOI shall, in a manner consistent and compatible with their respective missions: Consider and analyze potential climate change impacts when undertaking long-range planning exercises, setting priorities for scientific research and investigations, and/or when making major decisions affecting DOI resources")

[3]; Council on Environmental Quality, *Considering Cumulative Effects under the National Environmental Policy Act* 24, 42 (1997) (including documentation and analysis of global warming in the affected environment and effects), *available at* http://ceq.eh.doe.gov/nepa/ccenepa/ccenepa.htm (last visited Apr. 20, 2010).

0067-16
Greenhouse Gases
The current DEIS section on climate change includes similar conclusions as the research referenced in this comment. Nonetheless, the text has been revised to include some applicable language from a report from the U.S. Global Climate Change Research Program.

0067-17
Greenhouse Gases
The analysis of climate change and greenhouse gases included in the DEIS is consistent with guidance outline in the Council on Environmental Quality's "Draft NEPA Guidance on Consideration of the Effects of Climate Change and Greenhouse Gas Emissions" and the Secretary of the Interiors' Order No. 3226: "Climate Change and the Department of the Interior."

0067-18
Greenhouse Gases
The DEIS included an analysis of the effects of the proposed project, including environmental consequences, cumulative effects and mitigation measures, including those associated with climate change. Any potential effect of the proposed project on biologial resources adaptation to climate change would be speculative. Further, the impact of climate change on biological resources is beyond the scope of this EIS. The potential effects of the proposed project on biological resources are addressed in Section 4.6.

0067-19
Water Quality and Hydrology
The potential project effects on water supplies are described in the DEIS in section 4.5.2. and 4.19.5 as well as the Next Light Silver State - Groundwater Availability Study (2009). The Study modeled drawdown for two well scenarios, a 600 foot well and a 800 foot well. Under both simulations, representing pumping during project construction and operation, drawdown during the operation (long term) of the project was small (less than a foot at a distance of 3 miles from the well). Under an extreme peak demand scenario (continuous pumping of 550,000 gal/day during project construction), drawdown at 200 feet from the 600 foot deep well was simulated at about 19 feet; drawdown 200 feet from the 800 foot deep well was about 10 feet.

The estimated 550,000 gal/day scenario corresponds to filling water

trucks periodically during a day. However, the instantaneous groundwater withdraw will be reduced by pumping groundwater to a pond. The pond will have a volume of about 2 million gallons. Were the peak demand to persist for 10 days, the demand could be satisified with a groundwater pumping rate of 240 gal/min and utilization of the storage within the pond. While such an extended demand is unlikely, it defines an upper boundary to the required groundwater-pumping capacity.

Water for the project would be obtained through an agreement with the Las Vegas Valley Water District; currently water use in the Ivanpah Valley North Hydrographic Basin for LVVWD customers is significantly lower then water commitments. However, should the LVVWD or NDEP deem at any time that the project is impacting its ability to service its customers, then the project will be required to recharge the aquifer at a rate of 270 afy for the continued life of the project. The recharge would occur through rapid infiltration basins of treated effluent from the two Jean correctional facilities.

The project wells would be metered and the project would submit monthly water usage reports to the LVVWD. The LVVWD also would have access to the wells for meter reading, water quality, and water level sampling.

groundwater resources within the Ivanpah Valley needs to be performed as it relates to existing uses and those that are reasonably foreseeable.

IV. Biological Resources

Affected Environment: We are very concerned that no formal botanical or other wildlife surveys, other than a Desert Tortoise presence/absence sampling, were performed in support of the NEPA analysis. The DEIS indicates that botanical surveys will be conducted in the spring of 2010 and the results included in the Final Environmental Impact Statement (FEIS) for the proposed project. The importance of such surveys and their results cannot be overstated. Surveys in Ivanpah Valley in California in support of the NEPA analysis for the proposed Ivanpah Solar Electric Generating Station (SEGS) revealed the presence of several rare plant species including BLM designated sensitive species such as the White-margined Beardtongue. The potential for at least several BLM-designated sensitive species of plants and animals to occur on the proposed project site is very high.

Comment: Biological resources surveys for plant and animal species of special concern need to be done for the area that would be affected by the proposed project. Survey design and implementation needs to conform to the most recent federal and state standards for each species. 0067-20

Desert Tortoise: Survey methodology to establish a population estimate of the threatened Desert Tortoise on and adjacent to the proposed project was highly inadequate and appears to have been responsible for so few (four) individuals observed while sign (shell remains, scat, burrows) was relatively common and widespread. Thirty-nine triangular belt survey transects were performed on 19 square-miles of habitat during October 2008 and August 2009. Clearly these surveys were performed during the time of the year when Desert Tortoises would be largely underground and very difficult to detect visually. Thus, we question the accuracy and precision of the assessment of the Desert Tortoise population and its use in the impact analysis. Absent this information the analysis of the significance of the Desert Tortoise population and its habitat within and adjacent to the proposed project area cannot be determined.

Comment: Desert Tortoise survey methodology used in Ivanpah Valley in California for the proposed Ivanpah SEGS should be used for the proposed Silver State project. There is no reason or justification for two different survey protocols to be used on Federal land in Ivanpah Valley. The proposed Ivanpah SEGS located immediately west in California has similar elevation, slope, soil and vegetation, and also supports a significant Desert Tortoise population. Protocol surveys for the Desert Tortoise on that proposed project site resulted in the detection of approximately 25 individuals which resulted in a population estimate of approximately 50. 0067-21

DEIS section 3.6.3.2 describes, in part, the affected environment for the threatened Desert Tortoise. We are concerned about the apparent absence of an in-depth analysis of value of the habitat and its role in supporting Desert Tortoises throughout suitable habitat within the Ivanpah Valley including populations located north and south of the Ivanpah and Roach Dry Lakes. The recent USGS habitat model for the Mojave Desert Tortoise[4] reveals lands in Ivanpah Valley on either side of Interstate 15 have a very high habitat suitability rating for the Desert Tortoise and that these highly

[4] Nussear, K.E., Esque, T.C., Inman, R.D., Gass, Leila, Thomas, K.A., Wallace, C.S.A., Blainey, J.B., Miller, D.M., and Webb, R.H., 2009, Modeling habitat of the desert tortoise (*Gopherus agassizii*) in the Mojave and parts of the Sonoran Deserts of California, Nevada, Utah, and Arizona: U.S. Geological Survey Open-File Report 2009-1102, 18 p.

0067-20
Biological Resources
There has been a 2010 Botanical Study and 2009 Desert Torotise Study. The protocol and requirements of all surveys has been approved by BLM. The protocol of the desert tortoise surveys have been approved by USFWS.

0067-21
Biology - Desert Tortoise
The protocol that used to survey the desert tortoise was approved by USFWS and BLM.

suitable habitats extend north and south, providing habitat continuity between the Northeastern Mojave and Eastern Mojave Recovery Units and specifically within the Ivanpah, Fenner and Piute-Eldorado Desert Wildlife Management Areas.

Considering the habitat fragmentation and connectivity impacts associated with various existing and planned developments within Ivanpah Valley in Nevada and California, the importance of protecting remaining habitat to allow for Desert Tortoise population connectivity and long-term persistence is essential.

Within section 3.6.3.2 of the DEIS for the affected environment of Desert Tortoise, a troubling statement is made about relocation of Desert Tortoises: "The Ivanpah DWMA/ACEC is located immediately southwest of the Proposed Project area, over the state line; however, any relocated tortoises could not be moved to California." This statement has no bearing on the description of the affected environment. Furthermore, we are unaware of any legal or regulatory restriction that would preclude consideration of Desert Tortoise relocation on public land across the California-Nevada State Boundary. 0067-22

Comment: A robust analysis of suitability of remaining habitat in Ivanpah Valley for the Desert Tortoise should be conducted. This analysis should then be used to model and describe habitat and population connectivity throughout the valley and with Desert Tortoise populations within designated critical habitat units. Desert Tortoise populations occurring within these suitable habitats should then be described so that their significance can be established before the impact analysis is undertaken.

Comment: We suggest deleting statements within the affected environment chapter of the DEIS about Desert Tortoise relocation and whether or not it would be allowed across the State boundary. 0067-23

Section 4.6.5 of the DEIS addresses environmental consequences of the proposed action. The analysis of effects on the Desert Tortoise and its habitat are limited to the immediate project area and lack analysis on a regional scale.

Comment: We recommend that the effects of the proposed project on Desert Tortoise populations to the north and south of the project location be analyzed and disclosed. We are concerned about loss of habitat continuity and isolation of populations occurring on the eastern side of Ivanpah Valley. 0067-24

Golden Eagle: Surveys for Golden Eagle nesting and foraging areas that could be affected by the proposed project were not performed. It is our understanding that recent regulations for implementing the Bald and Golden Eagle Protection Act have been developed by the USFWS, and they require incidental take permits for activities that may take or harm the Golden Eagle, including loss of foraging habitat. In California, solar project applicants have been required to perform surveys for Golden Eagle nests and identify foraging habitat that would be affected by proposed projects.

Comment: BLM and the project applicant should ask the USFWS for guidance on the need to obtain an incidental take permit for Golden Eagles, and requirements for nesting and foraging habitat surveys. If determined necessary, these surveys and their results should be made available to the public for review and comment in a supplement to the DEIS. 0067-25

0067-22
Biology - Desert Tortoise
The text in section 3.6.3.2 has been revised.

0067-23
Biology - Desert Tortoise
The text in section 3.6.3.2 has been revised.

0067-24
Biology - Desert Tortoise
Thank you for your comment, a survey of desert tortoise populations outside of the Proposed Porject area is out of the scope of this project. Section 4.19.6 discuss the cumulative impacts to desert tortoise populations within the Ivanpah Valley.

0067-25
Biological Resources
The Proposed Project is in current consulltation with USFWS. The USFWS has indicated that the applicant is not required to obtain an incidental take permit for Golden Eagle, just for desert tortoise.

Bighorn Sheep: Information used to describe the occurrence of Bighorn in mountain ranges surrounding the proposed project appears to be from previous studies or reports that are not identified. For example, with regard to the Lucy Gray Mountains, the DEIS states they "are historically unoccupied by desert bighorn sheep and, therefore, it is assumed that desert bighorn sheep are absent from the Lucy Gray Mountains."

Bighorn movement habitats, such as valleys located between occupied suitable habitat in the various mountain ranges surrounding the proposed projects are generally inferred but not specifically identified. The proposed project is described as having the potential to affect Bighorn movements. The recommended mitigation measures to address these unspecified and general impacts appear to be standard measures that would do little, if anything, to reduce the impact of the proposed project on seasonal use such as foraging, or movement between permanently occupied habitats within various mountain ranges.

Comment: Focused surveys for Desert Bighorn in the Lucy Gray Mountains should be performed by subject matter experts using helicopter and on-ground surveys. Potential and known movement areas between the various ranges should be identified, and a more robust analysis of the potential impacts of the project on Bighorn should be performed. 0067-26

The biological resources management framework for public lands under BLM administration is guided, in part, by BLM policy contained in Manuals 6500 (Wildlife Habitat Management) and 6840 (Special Status Species). Manual 6500 directs BLM "…to manage habitat on an ecosystem basis for the purpose of ensuring self-sustaining populations and a natural abundance and diversity of wildlife, fish, and plant resources on the public lands." Ensuring self-sustaining fish and wildlife populations provides a measurable, affirmative conservation objective to the BLM that should be used to help structure renewable energy development decisions as well as associated mitigation strategies. Manual 6840 policy requires BLM to manage public lands to meet two objectives: 1) To conserve and/or recover ESA-listed species and the ecosystems on which they depend so that ESA protections are no longer needed for these species; 2) To initiate proactive conservation measures that reduce or eliminate threats to Bureau sensitive species to minimize the likelihood of and need for listing these species under the ESA.

Clearly, these two manuals provide critical direction to BLM in considering and analyzing environmental impacts of the proposed project and strengthen the importance of considering and analyzing alternatives that would allow BLM to meet its policy objectives with regard to wildlife resources, including those at risk in the Ash Meadows region.

Comment: Analysis of the effects of the proposed project and those of all existing and reasonable foreseeable projects within the region on the Desert Tortoise and its habitat should be strongly guided by the policies contained in Manuals 6500 and 6840. The analysis should be performed for each of the alternatives to the proposed project. All BLM Sensitive Species should be addressed in DEIS in a manner consistent with the policy contained in the 6500 and 6840 Manuals. 0067-27

Mitigation measures: NEPA requires agencies to include a discussion of the means to mitigate adverse environmental impacts of projects. 40 C.F.R. § 1502.16(h). Mitigation measures for impacts to sensitive biological resources, including habitat, should consider measures to avoid, reduce and compensate, in priority order. The DEIS indicates that the project area has not been assessed for the 0067-28

0067-26
Biological Resources
The Lucy Gray Mountains are historically unoccupied according to Nevada Department of Wildlife.

0067-27
Biological Resources
Thank you for you comments. The analysis of special status species has been conducted inaccordance with 6500 and 6840 manual.

0067-28
Biological Resources
For the special status species that were not specifically surveyed, the FEIS assumed presence of these species within the Proposed Project area. Mitigation measures were developed to minimze the impact to these special status species.

presence and abundance of certain species. In the absence of site specific information, relevant and effective mitigation measures cannot be identified. With regard to other species that are addressed in the DEIS, the proposed impact mitigation measures avoid consideration of any measures that would avoid impacts associated with the loss of habitat used for on a permanent or seasonal basis. Examples of this deficiency in the DEIS involve species such as the Chuckwalla, Gila Monster, Burrowing Owl and American Badger. For these species, which were not surveyed for and for which nothing is known with regard to the proposed project area, the mitigation measures call for surveys to be performed and avoidance or relocation procedures implemented in the event the species is found prior to and sometimes during construction. This is entirely inappropriate, ineffective and contrary to BLM policy.

Comment: Surveys for all BLM Sensitive and Special Status Species on and adjacent to the proposed project site should be performed so that their presence can be determined. If present, appropriate mitigation measures can be developed. The preferred mitigation measure is avoidance, which is also related to identifying a reasonable range of alternatives, including alternative project locations. For habitat for special status and other sensitive species that would be lost due to the proposed project, please indicate where compensation or replacement habitat to offset or reduce the impacts would be required. 0067-29

V. Visual Resources

Nighttime lighting: We are pleased that the DEIS recognizes visual values associated with the natural landscape and includes sections addressing effects of nighttime lighting. The DEIS broadly addresses potential impacts from nighttime lighting by simply stating that it would be designed to provide the minimum illumination needed to achieve safety and security objectives.

Comment: Modeling of the illumination effects of the proposed facility for safety and security needs to be performed and the change in nighttime conditions analyzed and disclosed in the final environmental impact statement. The modeling and analysis needs to include night sky viewing locations within the Mojave National Preserve. The National Park Service should be asked to take a lead role in this effort. The analysis should include actual night sky photographs plus simulations of the effects of the lighting at the proposed project from viewing points within the park. The sheer size of the proposed project, and one in which safety and security lighting is needed, poses a potentially significant impact to visual resources associated with the night sky. If impact mitigation measures are deemed necessary, they should be developed in concert with subject matter experts. 0067-30

Thank you for considering our comments. If you have any questions, please contact me at (916) 313-5800 x 110 or via email at jaardahl@defenders.org.

Sincerely,

Jeff Aardahl
California Representative

0067-29
Biological Resources
For analysis of this Proposed Project, the BLM Sensitve and Special Status species identified in Chapter 3 were assumed to be present within the landscape and the FEIS has evaluated the potential impacts to these BLM Sensitive and Special Status Species. To mitigate the potential impacts to these species, the FEIS has proposed Mitigation Measures and the applicant has proposed Applicant Proposed Measures. These neasures provide the guidelines to reduce the potential impacts to these species during the construction, operation and maintenance, and decommision of the Proposed Project.

0067-30
Biological Resources
brown/dildine night lighting (but what about Primm? How is this going t o produce an iota more nightime lighting than that?).

Greg Helseth
Renewable Energy Projects Manager
4701 N. Torrey Pines Drive
Las Vegas, NV 89130

June 1, 2010

Nextlight_Primm_NV_SEP@blm.gov

RE: Silver State Solar Energy Project Draft EIS

Dear Mr. Helseth,

Thank you for the opportunity to comment on the Draft EIS for the Silver State Solar Energy Project. While Red Rock Audubon Society generally supports renewable energy projects which displace fossil fuel derived electric power we feel that appropriate siting of these projects is essential so as to protect functioning desert ecosystems.

The first issue to be addressed is truth in advertising. The Draft EIS describes the project as a 400MW facility and implies that it would be comparable to a 400MW gas or coal fired power plant. This is not the case! The 400 MW rating is a maximum output at noon on the Summer solstice. The facility should properly be rated in terms of megawatt hours per year of output. Then it could be compared to a fossil fuel fired plant in terms of annual output. With a capacity factor of about 25% this proposed facility is really comparable to a 100MW fossil fuel fired generating facility. 0068-1

The Ivanpah Valley is part of the Northeastern Mojave Recovery Unit for the desert tortoise and is one of six evolutionarily significant units for the animal. While this information is acknowledged in the DEIS (p. 3-35) and the cumulative impacts section of the document acknowledges that there will be long term impacts to the desert tortoise population the only mitigation proposed is "relocation ". Previous attempts to relocate desert tortoises have not generally been very successful. The animals are familiar with the features of their home range, but when relocated are faced with surviving in an environment that they have no knowledge of, other than the location of an artificial nest burrow. We find the plans for dealing the cumulative impacts of this project and others in the Ivanpah Valley to be inadequate. 0068-2

The section on Fuels and Fire Management Impacts (Section 4-18) is confusing and mostly not applicable to the proposed project. "Cutting and pasting" pieces of other documents to create this one has not produced a useful section on fire management. 0068-3

The proposal (p. 2-25) to construct a 20 foot wide 13.65 mile long fire break outside of the 4.54 mile 15-foot wide service road which would be constructed outside the perimeter fence doesn't make sense. The service road and fire break should be one and the same and no longer than absolutely necessary. A fire break three times longer than the perimeter service road is nonsense. 0068-4

0068-1
Project Description
The energy produced is estimated to be a nominal 850,000 mWh.

0068-2
Biological Resources
The FEIS text addressing the cumulative analysis of desert tortoise has been revised to incorporate impacts to Northeastern Mojave Recovery Unit from the Propose Project and the planned projects.

0068-3
Wildland Fire and Fuels Management
Section 4-18 was prepared based on a thorough analysis of the alternatives and the anticipated effects on fuels and fire management that may occur with implementation of the Proposed Action or alternatives.

0068-4
Project Description
Your statement is included in the public record ad will be taken into account by decision-makers when they consider the proposed project.

0068-5

The DEIS (p. 4-41) states that a noxious weed control plan needs to be developed. Nowhere in the document does it mention that the localized rainwater runoff from the solar panels will significantly alter the vegetation regime. That localized runoff, combined with the soil disturbance from construction and maintenance activities will provide an ideal environment for the proliferation of non-native invasive plants such as Russian Thistle (*Salsola* sp.), brome grasses and Sahara mustard (*Brassuca tournefortii*). Sahara mustard is probably not present on the site today but is abundant along I-15 north of Primm and will probably be introduced to the site by the construction traffic. The noxious weed control plan needs to be in place before issuance of a right-of-way permit, not later. Noxious weed control needs to start on the first day of on the ground activities, not sometime later.

On p. 3-51 the document states that the Jean Lake allotment was last grazed in 1995. That allotment was re-issued to Cal Baird in the late 1990's and grazed until 2005 or 2006. That allotment has now been bought out and retired twice. Hopefully, it will not need to be bought out a third time. The section 4.6.7 on range is not really applicable since the Jean Lake and Roach Lake allotments are closed and should not be re-opened.

0068-6

On p. 4-61 the document states that the applicant will develop a site restoration plan. Considering the great difficulties involved in restoring native vegetation in the Mojave Desert it seems that a site restoration plan should be prepared and available prior to issuing a right-of-way permit. Once grading for the project is started it is too late to deal with an inadequate plan. The applicant needs to demonstrate to the public that it is capable of restoring the disturbed areas it will create.

0068-7

On p. 3-33 the plant known as New York Mountains Catseye (*Cryptantha tumulosa*) is described as a Nevada endemic. We would call your attention to the type locality mentioned in the common name. The New York Mountains are located in California. It is also known as the Mojave Catseye and is not endemic to Nevada. This DEIS needs to address regional issues: biological resources don't stop at State boundaries.

0068-8

Lastly, there really needs to be a long term mitigation plan for the loss of Mojave Desert habitat due to this proposed project and all the other renewable energy projects with active applications. The long-term costs to the BLM to monitor and address just the biological issues associated with this proposed project will require the equivalent of at least one full time employee. The applicant should be required to annually fund a mitigation bank so that the BLM has the resources to deal the long-term issues associated with this and other similar projects in the Southern Nevada District. The fee could be adjusted over time as multiple projects have to address common issues and economies of scale are recognized.

0068-9

Sincerely,

John E. Hiatt
Conservation Chair
Red Rock Audubon Society

0068-5
Invasive Plants/Noxious Weeds
The noxious weed plan will need to be submitted to and approved by BLM prior to the iniation of any construction activity.

0068-6
Grazing
We are updating page 3-49 of Section 3.6.5.1 and Table 3.6-2 on page 3-50 to reflect the most recent information regarding the purchases and closures of Jean Lake Allotment. Section 4.6.7 is written as such because it cannot be determined, at this time, whether the allotments will be re-opened at some point in the future.

0068-7
Mitigation
The restoration plan will be developed and approoved by BLM prior to the granting of the right-of-way permit.

0068-8
Biology - Plants
The text has been changed from endemic to native. The species is native to Nevada and California.

0068-9
Mitigation
Your statement is included in the public record and will be taken into account by decision-makers when they consider the proposed project.

8180 Placid Street
Las Vegas, NV 89123

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, CA 94105-3901

JUN 02 2010

Attn: Ron Wenker, State Director
Bureau of Land Management
BLM Nevada State Office
1340 Financial Blvd.
Reno, NV 89502

Subject: Draft Environmental Impact Statement for the Silver State Solar Energy Project, Clark County, Nevada [CEQ# 20100129]

Dear Mr. Wenker:

The U.S. Environmental Protection Agency (EPA) has reviewed the Draft Environmental Impact Statement (DEIS) for the Silver State Solar Energy Project (Project). Our comments are provided pursuant to the National Environmental Policy Act (NEPA), Council on Environmental Quality (CEQ) regulations (40 CFR Parts 1500-1508), and our NEPA review authority under Section 309 of the Clean Air Act.

I am directing this comment letter to you because of our concerns over the Project's potential environmental impacts, insufficient evaluation of potentially environmentally preferable alternatives, and implications for other renewable energy projects that have been proposed on Bureau of Land Management (BLM) lands throughout our Region. In light of these concerns, and our recent adverse rating of BLM's Amargosa Solar Millennium Project in Nevada, (comments submitted on May 17, 2010) and Imperial Valley Solar Project in California (comments submitted May 27, 2010), I would like to meet with you and BLM's Acting California State Director Jim Abbott in the next 30 days to discuss these issues further. I believe it is important for us to coordinate now to avoid unnecessary delays in the NEPA process as we all work toward the nation's renewable energy goals.

EPA supports increasing the development of renewable energy resources in an expeditious and well planned manner. Using renewable energy resources such as solar power can help the nation meet its energy requirements while minimizing the generation of greenhouse gases. While renewable energy facilities offer many environmental benefits, appropriate siting and design is of paramount importance if the nation is to make optimum use of its renewable energy resources without unnecessarily depleting or degrading its water resources, wildlife habitats, recreational opportunities, and scenic vistas.

BLM has identified thirty-four proposed renewable energy projects as "fast track" projects that are expected to complete the environmental review process and be ready to break ground by December 2010 in order to be eligible for funding under the American Recovery and Reinvestment Act. Twenty-eight of these projects are located in our Region; 13 of them are located in Nevada. We are aware that many more projects that have not been designated "fast-track" are also being considered by BLM. Many, if not all, of these projects, fast track or

otherwise, are proposed for previously undeveloped sites on public lands. In making its decisions regarding whether or not to grant rights-of-way for such projects, we recommend that BLM consider a full range of reasonable alternatives to minimize the adverse environmental impacts. Such alternatives could include alternative technologies or altered project footprints at the proposed location, as well as alternate sites, such as inactive mining or other disturbed sites that may offer advantages in terms of availability of infrastructure and less vulnerable habitats. Given the large number of renewable energy project applications currently under consideration, particularly in the Desert Southwest, we encourage BLM to apply its land management authorities in a manner that will promote a long-term sustainable balance between available energy supplies, energy demand, and protection of ecosystems and human health.

On July 30, 2009, EPA provided extensive scoping comments for the Silver State Solar Energy Project, which included detailed recommendations regarding purpose and need, range of alternatives, water resources, and other resource areas of concern. On June 1, 2010, we requested and received an informal one-week extension of the comment period for the DEIS. We appreciate your willingness to provide us with additional time to complete our review.

Based on our review of the DEIS, we have rated the document as *Environmental Objections – Insufficient Information* (EO-2). Please see the enclosed "Summary of EPA Rating Definitions." An "EO" signifies that EPA's review of the DEIS has identified potential significant environmental impacts that should be avoided in order to provide adequate protection for the environment. Corrective measures may involve substantial changes to the project. A "2" rating signifies that the DEIS does not contain sufficient information for EPA to fully assess environmental impacts that should be avoided in order to fully protect the environment.

We are particularly concerned about the potential impact of the proposed project to waters of the United States, and this is the basis for our "EO" rating. We understand that the jurisdictional delineation of waters of the United States has not been finalized and the full extent of impacts has not been determined. Based on the preliminary analysis, however, the impacts appear to be of a magnitude that is a significant environmental concern, especially within an arid ecosystem. In addition, some portions of the Project would be located in areas of high flood risk, which raises environmental as well as engineering and financial sustainability concerns due to increased erosion, migration of channels, local scour, and potential destabilization and damage to valuable facilities and equipment. We are also concerned that many of the biological field surveys either have not been completed, or were not completed in time to present results in the DEIS, nor is there adequate information about the availability of groundwater in the Ivanpah Valley. Finally, we are concerned about the indirect and cumulative effects associated with the influx of other large-scale solar energy projects proposed in the Ivanpah Valley.

EPA strongly encourages BLM to address comments provided on the subject DEIS in the Final Environmental Impact Statement (FEIS). The FEIS should also demonstrate that the proposed Project is the *Least Environmentally Damaging Practicable Alternative* (LEDPA), and identify measures that could mitigate the impacts. It should include a robust discussion of all avoidance and mitigation measures proposed for the Project and include an outline of the requirements of a compensatory mitigation plan.

We believe it is imperative that BLM, resource agencies and project applicants coordinate early with other agencies and stakeholders on site selection and project design in order to facilitate timely environmental reviews. EPA appreciates the opportunity to provide input on this Project and the multitude of DEISs under preparation for renewable energy projects in our Region. We are available to further discuss all recommendations provided. Please send one hard copy of the FEIS and two CD ROM copies to this office at the same time it is officially filed with our Washington D.C. Office. If you have any questions, please contact me at 415-972-3843, or contact Ann McPherson, the lead reviewer for this project. Ann can be reached at 415-972-3545 or mcpherson.ann@epa.gov.

Sincerely,

Enrique Manzanilla, Director
Communities and Ecosystem Division

Enclosures: Summary of EPA Rating Definitions
Detailed Comments

Cc: Gregory Helseth, Bureau of Land Management
Ray Brady, Energy Policy Team Lead, Bureau of Land Management
Colonel Thomas C. Chapman, U.S. Army Corps of Engineers, Sacramento, CA
Patricia L. McQueary, U.S. Army Corps of Engineers, St. George, UT
Amy M. LaVoie, U. S. Fish and Wildlife Service, Las Vegas, NV
Brian A. Novosak, U.S. Fish and Wildlife Service, Las Vegas, NV

SUMMARY OF EPA RATING DEFINITIONS*

This rating system was developed as a means to summarize the U.S. Environmental Protection Agency's (EPA) level of concern with a proposed action. The ratings are a combination of alphabetical categories for evaluation of the environmental impacts of the proposal and numerical categories for evaluation of the adequacy of the Environmental Impact Statement (EIS).

ENVIRONMENTAL IMPACT OF THE ACTION

"LO" (Lack of Objections)

The EPA review has not identified any potential environmental impacts requiring substantive changes to the proposal. The review may have disclosed opportunities for application of mitigation measures that could be accomplished with no more than minor changes to the proposal.

"EC" (Environmental Concerns)

The EPA review has identified environmental impacts that should be avoided in order to fully protect the environment. Corrective measures may require changes to the preferred alternative or application of mitigation measures that can reduce the environmental impact. EPA would like to work with the lead agency to reduce these impacts.

"EO" (Environmental Objections)

The EPA review has identified significant environmental impacts that should be avoided in order to provide adequate protection for the environment. Corrective measures may require substantial changes to the preferred alternative or consideration of some other project alternative (including the no action alternative or a new alternative). EPA intends to work with the lead agency to reduce these impacts.

"EU" (Environmentally Unsatisfactory)

The EPA review has identified adverse environmental impacts that are of sufficient magnitude that they are unsatisfactory from the standpoint of public health or welfare or environmental quality. EPA intends to work with the lead agency to reduce these impacts. If the potentially unsatisfactory impacts are not corrected at the final EIS stage, this proposal will be recommended for referral to the Council on Environmental Quality (CEQ).

ADEQUACY OF THE IMPACT STATEMENT

Category "1" (Adequate)

EPA believes the draft EIS adequately sets forth the environmental impact(s) of the preferred alternative and those of the alternatives reasonably available to the project or action. No further analysis or data collection is necessary, but the reviewer may suggest the addition of clarifying language or information.

Category "2" (Insufficient Information)

The draft EIS does not contain sufficient information for EPA to fully assess environmental impacts that should be avoided in order to fully protect the environment, or the EPA reviewer has identified new reasonably available alternatives that are within the spectrum of alternatives analyzed in the draft EIS, which could reduce the environmental impacts of the action. The identified additional information, data, analyzes, or discussion should be included in the final EIS.

Category "3" (Inadequate)

EPA does not believe that the draft EIS adequately assesses potentially significant environmental impacts of the action, or the EPA reviewer has identified new, reasonably available alternatives that are outside of the spectrum of alternatives analyzed in the draft EIS, which should be analyzed in order to reduce the potentially significant environmental impacts. EPA believes that the identified additional information, data, analyzes, or discussions are of such a magnitude that they should have full public review at a draft stage. EPA does not believe that the draft EIS is adequate for the purposes of the NEPA and/or Section 309 review, and thus should be formally revised and made available for public comment in a supplemental or revised draft EIS. On the basis of the potential significant impacts involved, this proposal could be a candidate for referral to the CEQ.

*From EPA Manual 1640, Policy and Procedures for the Review of Federal Actions Impacting the Environment.

U.S. EPA DETAILED COMMENTS ON THE DRAFT ENVIRONMENTAL IMPACT STATEMENT FOR THE SILVER STATE SOLAR ENERGY PROJECT, CLARK COUNTY, NEVADA, JUNE 2, 2010

Project Description

NextLight Renewable Power, LLC, has submitted an application for a right-of-way (ROW) for the construction, operation, maintenance, and termination of a solar energy generation site. The proposed project would generate approximately 400 megawatts (MW) of electricity using photovoltaic (PV) panels. The project is expected to operate for approximately 50 years and would be located on approximately 7,840 acres of public lands east of Primm, Nevada. The proposed project would be built in three phases: Phase 1 – 60 MW; Phase 2 – 140 MW; Phase 3 – 200 MW. The proposed project would include solar fields, tracker systems or fixed panels, electrical power collection system, right-of-way appurtenances, two substations (North and South substation), switchyard facilities, transformers, transmission lines, access roads, flood and drainage controls, and a fire break. The proposed project has been designed to deliver power to both the Nevada market, via Nevada Energy's Walter M. Higgins Power Generating Station, and the California market, via Southern California Edison's proposed 220 kilovolt (kV) upgraded Eldorado-Ivanpah Transmission project (pg. 2-21).

The Silver State Solar Energy project was initially described as Silver State South Solar Project (NVN-085077) and Silver State North Solar Project (NVN-085801). According to the Draft Environmental Impact Statement (DEIS), the Bureau of Land Management (BLM) will approve or deny the ROW application for NVN-085077. No further reference is made to Silver State North Solar Project (NVN-085801).

Recommendation:
Clarify whether Silver State North and Silver State South have been merged into one project with one ROW application. Define the boundaries for ROW applications NVN-085077 and NVN-085801. 0070-1

Compliance with Clean Water Act Section 404

In our scoping comments (July 30, 2009), the U.S. Environmental Protection Agency (EPA) noted that the project applicant should coordinate with the U.S. Army Corps of Engineers (Corps) to determine if the proposed project requires a Section 404 permit under the Clean Water Act (CWA). The purpose of the CWA is to restore and maintain the chemical, physical, and biological integrity of waters of the United States (waters of the U.S., WUS, or jurisdictional waters). These goals are achieved, in part, by prohibiting discharges of dredged or fill material that would result in avoidable or significant adverse impacts on the aquatic environment. Pursuant to Section 404 of the CWA, discharge of dredged or fill material to WUS requires a permit issued by the Corps. If a permit is required, EPA will review the project for compliance with the *Federal Guidelines for Specification of Disposal Sites for Dredged or Fill Materials* (40 CFR 230) (Guidelines), promulgated pursuant to Section 404(b)(1) of the CWA. The burden to demonstrate compliance with the Guidelines rests with the permit applicant. The Guidelines contain four main requirements that must be met to obtain a Section 404 permit:

0070-1
Project Description
Yes, both casefiles have been merged into one ROW application.

a) Section 230.10(a) prohibits a discharge if there is a less environmentally damaging practicable alternative to the proposed project.
b) Section 230.10(b) prohibits discharges that will result in a violation of water quality standards or toxic effluent standards, jeopardize a threatened or endangered species, or violate requirements imposed to protect a marine sanctuary.
c) Section 230.10(c) prohibits discharges that will cause or contribute to significant degradation of waters. Significant degradation may include individual or cumulative impacts to human health and welfare; fish and wildlife; ecosystem diversity, productivity and stability; and recreational, aesthetic or economic values.
d) Section 230.10(d) prohibits discharges unless all appropriate and practicable steps have been taken to minimize potential adverse impacts of the discharge on the aquatic ecosystem.

Recommendation:
Discuss and demonstrate compliance with the Guidelines in the Final Environmental Impact Statement (FEIS). | 0070-2

Geographic Extent of Waters of the United States

EPA is concerned about the potential adverse impact to aquatic resources that would result from the project, as proposed. The DEIS states that a delineation of waters of the U.S. was conducted by CH2MHill and the Corps for the project area in August 2009 (pg. 3-26). Based on the delineation, the project could impact potentially jurisdictional waters on the southern portion of the project area. According to the DEIS, the Corps also indicated that it would likely assert jurisdiction over all drainages greater than or equal to 3 feet in width that intersect the Nevada-California state line (pg. 3-26). The field survey identified numerous interconnected ephemeral washes ranging in size from small wash features (3 to 10 feet wide) to medium, broad drainages (10 to 20 feet wide) (pg. 3-22). It should be noted that the lateral extent of federal jurisdiction on drainages is determined by the presence of an ordinary high water mark (OHW), not by an arbitrary channel width. Jurisdictional channels that exhibit an OHW mark could be less than three feet in width. A complete assessment of the potential effects to jurisdictional waters, riparian areas, and wetlands, caused directly or indirectly by the proposed project cannot be completed until the Jurisdictional Determination is issued by the Corps.

EPA has received a copy of the preliminary jurisdictional determination[1] for 2,900 acres designated as Silver State South PV site (April 8, 2010). Based on this analysis, 37.7 acres of wetlands or other water bodies may be jurisdictional waters of the U.S. The Corps notes that drainages in the Silver State North PV site will be addressed in a separate approved Jurisdictional Determination and will require coordination with the EPA. At present, we are unable to determine the full extent of project impacts to jurisdictional waters.

[1] *Preliminary Jurisdictional Determination of Wetlands and Waters of the U.S. for Silver State South PV Site,* Clark County, Nevada, April 8, 2010.

0070-2
Water Quality and Hydrology
The FEIS will comply with all applicable federal, state, and local rules and regulations.

Recommendation:
The FEIS should include a final determination of the extent of waters of the United States at the project site. 0070-3

Analysis of Alternatives – 40 CFR 230.10(a)

In order to comply with the Guidelines, the applicant must comprehensively evaluate a range of alternatives to ensure that the *"preferred"* alternative is the *Least Environmentally Damaging Practicable Alternative* (LEDPA). Identification of the LEDPA is achieved by performing an alternatives analysis that estimates the direct, indirect, and cumulative impacts to jurisdictional waters resulting from a set of on- and off-site project alternatives. Project alternatives that are not practicable and do not meet the project purpose are eliminated. The LEDPA is the remaining alternative with the fewest impacts to aquatic resources, so long as it does not have other significant adverse environmental consequences. Only when this analysis has been performed can the applicant and the permitting authority be assured that the selected alternative is the LEDPA (40 CFR 230.10(a)).

As currently proposed, we cannot determine whether or not the preferred alternative represents the LEDPA. According to the DEIS, the applicant evaluated two types of technology: concentrating solar power (CSP) technology and PV technology (pg. 2-6). CSP technology was rejected because it would require more acreage and additional water for cooling components. PV technology was selected for its reduced water consumption, reduced grading requirements, reduced impact on off-highway vehicle (OHV) use, and reduced visual impact. While these are important considerations, it is not possible to determine the LEDPA in the absence of an approved determination of the geographic extent of waters of the U.S. on the project site.

The DEIS contains a cursory evaluation of one off-site alternative (pg. 2-6), and includes two on-site alternatives with different drainage configurations. Both of the on-site alternatives appear to avoid jurisdictional waters to some degree by preserving some natural drainages; however, the extent to which jurisdictional waters are avoided is not evaluated within the DEIS. Nor does the DEIS provide detailed information on the potential for reconfiguration or redesign of the project layout, roads, and drainage channels that could result in avoidance of jurisdictional waters. The DEIS does not discuss the feasibility of constructing a smaller-sized project that would have fewer environmental impacts. In contrast, it states that no comments were received during scoping suggesting that the Proposed Project should have a smaller footprint or should be reduced in capacity (pg. 2-6). Although this may be true, it does not preclude the applicant nor BLM from examining the issue further. Based on the information in the DEIS, it appears that a smaller plant alternative may be practicable and less environmentally damaging to jurisdictional waters when compared to the proposed project alternatives.

Recommendation:
EPA recommends that BLM include analyses of additional on- and off-site alternatives in the FEIS and identify the LEDPA. The alternatives should encompass a reasonable range of Project sizes and configurations that could be less environmentally damaging, while meeting the purpose and need of the Project. Sufficient detail should be provided to allow 0070-4

0070-3
Water Quality and Hydrology
The Applicant received a preliminary jurisdictional determination from the USACE on April 8, 2010 and has requested an approved determination from the USACE. The preliminary jurisdiction determination stated that the USACE will not require a Section 404 Permit for the construction of Phase I of the Project. The Applicant will conduct a formal jurisdictional delineation prior to the construction of Phases II and III of the project once final engineering for the location of project-specific features in these project areas is complete.

0070-4
Alternatives
We believe the alternatives analyzed in detail represent a reasonable range and meet the purpose and need for the EIS. The analysis did not reveal the need for an alternative with a reduced size, although it did result in design changes. For instance, the proponent modified its site layout to avoid washes and a floodplain. The design was also modified to reduce impacts to visual resources.

for meaningful comparisons.

Minimize Potential Adverse Impacts and Mitigation – 40 CFR 230.10(d)

Pursuant to the Guidelines, mitigation of project impacts begins with the avoidance and minimization of direct, indirect, and cumulative impacts to the aquatic ecosystem, followed by compensatory measures if a loss of aquatic functions and/or acreage is unavoidable. Compensatory mitigation is, therefore, intended only for unavoidable impacts to waters after the LEDPA has been determined. For this reason, it would be premature to examine in detail any mitigation proposal before compliance with 40 CFR 230.10(a) is established.

The DEIS has not clearly demonstrated that all practicable measures to minimize unavoidable impacts to potential waters of the United States have been incorporated into the proposed project design. The Proposed Action (BLM's Preferred Alternative) would disturb a total area of 2,967 acres (pg. 2-2). Drainage controls for the Proposed Action would consist of a series of five small and wide earthen drainage control berms that would contain surface runoff flows to existing primary drainages (stormwater flow corridors) across the site. The drainage structures would result in a temporary disturbance of 11 acres and a permanent disturbance of 17.7 acres. The Modified Site Layout Alternative would disturb a total area of 4,818 acres (pg. 2-2). Drainage controls for this alternative would consist of several upstream drainage control structures (level spreader detention basins, diversion berms, channels, and debris basins) extending in a linear pattern along the entire eastern border of the Proposed Project site. The drainage structures would result in a temporary disturbance of 1,150 acres and a permanent disturbance of 250 acres. The DEIS does not specify the extent of impacts on jurisdictional waters with either alternative. | 0070-5

We believe there may be project designs that avoid and minimize direct, indirect, and cumulative impacts to potential jurisdictional washes by reducing the fill footprint, utilizing existing drainage channels, and if necessary, constructing drainage channels with natural features. The DEIS provides no assessment of the cumulative impacts on waters of the United States of the proposed project and other proposed projects in the area. Finally, the DEIS includes no compensatory mitigation measures for potential impacts to jurisdictional waters. In short, the project appears not to comply with EPA's Guidelines, nor with the Corps' and EPA's regulations governing mitigation under Section 404 of the CWA.[2]

Recommendations:

Discuss the steps taken to avoid and minimize impacts to waters of the United States. To the extent any aquatic features that could be affected by the project are determined not to constitute waters of the U.S., EPA recommends that the FEIS characterize the functions of such features and discuss potential mitigation. | 0070-6

Include in the FEIS a mitigation plan for unavoidable impacts to waters of the United States, as required by Corps and EPA regulations. | 0070-7

[2] Compensatory Mitigation for the Loss of Aquatic Resources, Final Rule, 33CFR 325 and 332, April 10, 2008.

0070-5
Mitigation
The Applicant received a preliminary jurisdictional determination from the USACE on April 8, 2010 and has requested an approved determination from the USACE. The preliminary jurisdiction determination stated that the USACE will not require a Section 404 Permit for the construction of Phase I of the Project, as no juridictional waters will be impacted during this project phase. The Applicant will conduct a formal jurisdictional delineation prior to the construction of Phases II and III of the project once final engineering for the location of project-specific features in these project areas is complete.

0070-6
Water Quality and Hydrology
Impacts to all water resources in the project area are described in section 4.19.5 of the DEIS.

0070-7
Mitigation
No unavoidable impacts to waters of the U.S. have been determined for the Project.

Ephemeral Washes, Flood Zones, and Drainage

EPA is concerned about the potential impact to the ephemeral water segments located within the project area. The DEIS provides basic hydrologic information on the location of the proposed project, including a detailed map of the water resources in the project area (pg. 3-23), but does not illustrate the location of Roach Dry Lake or Ivanpah Dry Lake, nor does it provide detailed information of drainages extending into California.

Recommendation:
Include a detailed map of the water resources and hydrographic basins surrounding the proposed project, including Ivanpah Dry Lake (California) and Roach Dry Lake (Nevada), as well as drainages within California. | 0070-8

The DEIS describes a hydrology study predicting flood hazards for the Ivanpah Valley (pg. 4-26). Figure 4.5-1 illustrates the geologic flood hazard class associated with the proposed site. Flood hazards associated with alluvial fans are particularly hard to characterize using conventional methods. Flooding on active alluvial fans may consist of high velocity, sediment laden floodwater that may follow multiple paths simultaneously; flow paths may shift position during even low or moderate flows. Flooding can also occur as broad, largely unconfined shallow flow swaths that inundate large areas. Several components of the Project in the northern portion of the proposed site would be built in areas of the alluvial fan where the flood risk is very high. EPA is concerned about the increased flood hazard risk associated with these areas.

Recommendation:
Consider, and discuss in the FEIS, options for redesigning the Project configuration to avoid high flood hazard areas to a greater degree, particularly in the northern section of the proposed site. | 0070-9

Natural washes perform a diversity of hydrologic and biogeochemical functions that directly affect the integrity and functional condition of higher-order waters downstream. Healthy ephemeral waters with characteristic plant communities control rates of sediment deposition and dissipate the energy associated with flood flows. Ephemeral washes also provide habitat for breeding, shelter, foraging, and movement of wildlife. Many plant populations are dependent on these aquatic ecosystems and adapted to their unique conditions. The potential damage that could result from disturbance of flat-bottomed washes includes alterations to the hydrological functions that natural channels provide in arid ecosystems: adequate capacity for flood control, energy dissipation, and sediment movement, as well as impacts to valuable habitat for desert species.

Recommendation:
Include information on the functions and locations of ephemeral washes in the project area because of the important hydrologic and biogeochemical role these washes play in direct relationship to higher-order waters downstream. | 0070-10

The DEIS states that the applicant proposes to maintain existing drainage patterns throughout the solar field; however, construction and operation of the proposed project would

0070-8
Maps
Conor

0070-9
Project Design
Because of potential impacts from flooding the proponent considered and incorporated changes in the site design to mitigate impacts to high flood hazard areas. The EIS describes the residual impacts under both action alternatives.

0070-10
Water Quality and Hydrology
The locations of ephemeral washes in the project area are shown on Figure 3.5-1. Hydrologic Features.

likely change natural runoff patterns, thereby affecting erosion and deposition. The applicant proposes to construct berms to prevent lateral migration of the four major drainages in the proposed project site. The berms would require rock reinforcement (pg. 2-34) and be rip-rapped to prevent scour. Along the interior washes, vegetation would be replanted on the southern berm of each wash where it would not cause shading of the solar array (pg. 2-34). Across the remainder of the site, drainage occurs via sheet flow and in smaller washes that feed into the four large drainages. Under the proposed drainage plan, this character of drainage would be maintained. Vegetation performs several vital functions, including soil stabilization and slowing of stormwater flows. Vegetation would be mowed to a height of 12 inches, resulting in a reduction of function in slowing stormwater and stabilizing the soil (pg. 4-24). Precipitation would also flow off of the panels and may create localized gullies that may alter surface water flow. According to the DEIS, however, the installation of berms would have an insignificant effect on the flow depths and velocities in the washes, and hydrologic modeling indicates that flow would be consistent with pre-construction conditions (pg. 4-24). We note, however, that limited research has been conducted regarding effects associated with development on alluvial fans in the Mojave Desert, and assumptions that the effects would be insignificant are, as noted in the DEIS, contingent on the accuracy of surface water modeling (pg. 4-24).

The detention drainage basin system in Alternative 3 would capture stormwater from the mountains in a series of detention basins on the eastern border of the site. Stormwater would be collected and released as sheet flow onto the project site at a controlled rate. This runoff would be released at a rate consistent with runoff from a 10- or 25-year, 24-hour rain storm. In the event of a major precipitation event (exceeding the 100-year storm) the detention basins would drain into a series of peripheral drainage channels via emergency spillways. The peripheral drainage channels would discharge at the western edge of the project site. Outflows would coincide with existing ephemeral stream channels (pg. 4-29).

Recommendations:

To avoid and minimize direct and indirect impacts to desert washes (such as erosion, migration of channels, and local scour) do not place PV panels in washes. | 0070-11

Commit to the use of natural washes, in their present location and natural form and including adequate natural buffers, for flood control to the maximum extent practicable. | 0070-12

Minimize the number of road crossings over washes. Road crossings should be designed to provide adequate flow through during storm events. | 0070-13

Demonstrate that downstream flows will not be disrupted due to proposed changes to any natural washes nor the excavation of large amounts of sediment. | 0070-14

Include a functional assessment of the waters on the proposed project site and the changes to the functions of those waters as a result of the proposed project. | 0070-15

Include the Conceptual Drainage Report (Louis Berger, 2010) within an appendix in the FEIS. | 0070-16

0070-11
Project Design
PV panels will not be sited in washes. The proposed locations of the panels are shown on Figures in Section 2 of the EIS.

0070-12
Project Design
Under the preferred alternative, the majority of the site would be drained by sheet flow to on- and off-site drainages. The drainage plan would use existing natural washes, by reinforcing their banks, and allow the remaining stormwater flow to pass through the site naturally. The drainage control features would consist of stormwater flow corridor reinforcement, berms within the solar array, and a drainage control berm on the eastern exterior of the solar array. Five small and wide earthen drainage control berms would contain and direct surface runoff flows to existing primary drainages (stormwater flow corridors) across the site. The berms would be constructed in line with the existing flow direction and along the boundaries of four natural flood corridors - each comprised of multiple washes.

0070-13
Project Design
Roads would be sited to minimize surface water crossings. Mitigation measure BIO-16 applies to crossings which cannot be avoided:

- MM BIO-16: Drainage Crossings Design. If drainages cannot be avoided by infrastructure placement, then the Applicant will design drainage crossings to accommodate estimated peak flows and ensure that natural volume capacity can be maintained throughout construction and upon post-construction restoration. This measure is necessary to minimize the amount of erosion and degradation to which drainages are subject.

0070-14
Water Quality and Hydrology
The effects of the project on water resources is described in Section 4.5 of the DEIS.

0070-15
Water Quality and Hydrology
The effects of the project on water resources is described in Section 4.5 of the DEIS.

0070-16
General

The effects of the project on water resources is described in Section 4.5 of the DEIS.

The DEIS does not provide detailed information about fencing or the effects of fencing on drainage systems. The DEIS states that if scour were to cause PV panels to collapse, the panels and footings could be transported downstream with flood flows resulting in damage to project components on and off site (pg. 4-26). According to the DEIS, the fence would be made of frangible materials in some areas in order to mitigate possible changes in flow due to debris build-up (pg. 2-25). The fence would be constructed using materials that would break up if large amounts of debris were to build up. This would prevent large piecing of fence material being transported downstream in a flood flow (pg. 4-26).

Recommendation:
The last statement seems contradictory, because, if the fence breaks up due to large amounts of debris, materials (fencing, debris, panels, and footings) would still be transported downstream. We suggest clarifying this sentence. | 0070-17

In this region, storms can be sudden and severe, resulting in flash flooding. Fence design must address hydrologic criteria, as well as security performance criteria. The National Park Service recently published an article[3] on the effects of the international boundary pedestrian fence on drainage systems and infrastructure. We recommend that BLM review this article to ensure that such issues are adequately addressed.

Recommendation:
Provide more detailed information about fencing and potential effects of fencing on drainage systems within the FEIS. Ensure that the fencing proposed for this project will meet appropriate hydrologic performance standards. | 0070-18

Groundwater Resources

EPA is concerned about the potential impacts associated with pumping groundwater in the Ivanpah Valley Basin. The project site is located in the Ivanpah Valley Northern Part (164A) and Southern Part (164B) hydrographic basins. The basins consist of alluvial-basin fill groundwater aquifers contained in unconsolidated deposits. According to the Nevada Division of Water Resources (NDWR) Hydrographic Area Summaries, perennial yield is estimated at 700 afy in the Ivanpah Valley-Northern Part and 250 afy in the Ivanpah Valley Southern-Part. More detailed information on groundwater resources, including perennial yield, annual duty, and pending annual duty, was not presented in the DEIS.

Groundwater rights are held by the Las Vegas Valley Water District (LVVWD). The DEIS states that a water service agreement with the LVVWD was scheduled for Board approval in February 2010, but the findings were not available at the time of publication. The proposed project would require 600 acre-feet of water over the four year construction period and 21 acre-feet/year (afy) for biannual panel washing and domestic potable water supply (pg. 4-21). No more than 200 acre-feet would be allowed in any single year for construction purposes. Water

[3] National Park Service, August 2008, Effects of the International Boundary Pedestrian Fence in the Vicinity of Lukeville, Arizona, on Drainage Systems and Infrastructure, Organ Pipe Cactus National Monument, Arizona,

0070-17
Water Quality and Hydrology
The suggested clairification has been incorporated into the Final EIS.

0070-18
Water Quality and Hydrology
Fencing is described throughout Chapter 4 of the EIS.

would be supplied from two wells that would be drilled on the Project site. A temporary water storage pond would be set up near the larger well. The DEIS states that an analysis of 23 wells in the immediate vicinity concluded that water consumption for the Project would not adversely affect water supply or cause drawdown with the use of the temporary storage pond.

Recommendations:

Discuss the perennial yield, active annual duty, and pending annual duty within the Ivanpah Valley Northern and Southern hydrographic basins. Evaluate the extent to which existing water rights are fully utilized. Discuss whether groundwater resources are over appropriated in these basins. | 0070-19

Demonstrate whether there is sufficient groundwater for the lifetime of this project, considering current and reasonably anticipated pumping levels in the basin. | 0070-20

Describe whether a groundwater model was used in the analysis of 23 wells. Provide more detailed information on the analysis and any corresponding assumptions within the FEIS. Include a copy of the well analysis report within an appendix in the FEIS. | 0070-21

Clarify whether the water service agreement with the LVVWD was approved and, if so, describe the terms of the agreement in the FEIS. | 0070-22

Cumulative Impacts Analysis

BLM has received over 470 renewable energy project applications,[4] with a projected capacity of 97,000 MW of electricity. The BLM is currently processing 62 solar applications in California and 58 solar applications in Nevada. In addition, the BLM and Department of Energy (DOE) are currently preparing the Solar Programmatic EIS (Solar PEIS) to evaluate utility-scale solar energy development in six Western states (Arizona, California, Colorado, New Mexico, Nevada, and Utah). Twenty-four study areas have been identified in the six Western states, including four study areas in California and seven study areas in Nevada. The DEIS presents a brief discussion of cumulative impacts in the Ivanpah Valley, but does not provide detailed information on any of these other specific projects, nor the Solar PEIS. The DEIS lists two solar projects (Ivanpah SEGS and First Solar) in close proximity to the proposed project in California, but does not reference two solar projects near Jean, Nevada (NVN-083083 and NVN-086156).

Recommendations:

Update the list of reasonably foreseeable projects to include the two solar projects proposed near Jean, Nevada. | 0070-23

Include a map of reasonably foreseeable projects within a larger cumulative effects area, for example, within a 25-mile range of the proposed project. | 0070-24

[4] "Secretary Salazar, Senator Reid Announce 'Fast-Track' Initiatives for Solar Energy Development on Western Lands", U.S. Department of Interior, News Release, June 29, 2009. http://www.blm.gov/wo/st/en/info/newsroom/2009/june/NR_0629_2009.html

0070-19
Water Quality and Hydrology
The perennial yield of the Ivanpah Valley Basin - Northern Part (Hydrographic Area 164B) is 700 Acre-feet per year (AFY); the total appropriated use is 2,107.76 AFY.The perennial yield of the Ivanpah Valley Basin - Southern Part (Hydrographic Area 164A) is AFY; the total appropriated amount is 780.75 AFY.

The project proposes to withdaw water soley from the Ivanpah Valley North Hydrographic Basin. According to the LVVWD, the current water use in the basin for LVVWD customers is significantly lower than water commitments.

0070-20
Water Quality and Hydrology
The availability of groundwater for the project was analzyed in the Next Light Silver State - Groundwater Availability Study (2009). The study used existing groundwater data from wells in the project vicinity as well as computer modeling to determine that groundwater resources should be sufficient to sustain the construction and operational demands of the project.

The project will obtain water from the Las Vegas Valley Water District, which currently has water available to meet the project's demands. However, if at any time the District or NDEP feels that its customers are being compromised, the project will be required to recharge the aquipher at a rate of 270 afy for the continued life of the project. Under the terms of the Water Service Agreement, the project wells will be metered and the project will be required to submit monthly water use reports to the District. The District will also have access to the wells for meter reading, water quality, and water level sampling.

Water rights for the project will be reviewed by the State Engineer prior to being issued in order to determine if there is sufficient groudwater for the life of the project.

0070-21
Water Quality and Hydrology
The NextLight Silver State - Groundwater Availability Study was completed in Nov. 2009 by West Yost Associates. The study used the USGS computer program WTAQ (Barlow and Moench, 1999) to simulate drawdowns in the proprosed project wells and the surrounding area. The parameters used for the modeling are based on the hydraulic characteristics of the unconsolidated deposits in the project and are described in Section 3.1 of the report.

0070-22
Water Quality and Hydrology
Water for the project would be obtained through an agreement with the Las Vegas Valley Water District; currently water use in the Ivanpah Valley North Hydrographic Basin for LVVWD customers is significantly lower then water commimitments. However, should the LVVWD or NDEP deem at any time that the project is impacting its ability to service its customers, then the project will be required to recharge the aquifer. The recharge would occur through rapid infiltration basins of treated effluent from the two Jean correctional facilities.

The project wells would be metered and the project would submit monthly water usage reports to the LVVWD. The LVVWD also would have access to the wells for meter reading, water quality, and water level sampling.

0070-23
Cumulative Impacts
Projects considered in the cumulative impact analysis were selected in consultation with the BLM. The projects were not added because they are outside the cumulative impact study area.

0070-24
Cumulative Impacts
The cumulative impact analysis geographic scope was developed for each resource area and the scope is explained in Section 4.19 for each resource that may be cumulatively impacts. These boundaries were developed with the BLM to focus the analysis.

The DEIS presents a brief cumulative impacts analysis discussion, but does not provide detailed information nor an in-depth analyses of potential impacts for several resources, including groundwater (pg. 4-134). The DEIS states that the capacity of the local aquifer is not currently known. It does not consider what will happen to groundwater levels if pumping continues at existing rates, nor what might happen if there is an increase associated with pumping due to the influx of large-scale solar projects in the area. Due to the scarcity of water in the region, the large number of solar projects proposed nearby, and the ever-increasing demand for this commodity, EPA is concerned about the depletion of this resource in the Ivanpah Valley, and the potential impact on aquatic and riparian communities.

Recommendations:

Estimate the annual water use associated with the reasonably foreseeable large-scale solar projects proposed in the Ivanpah Valley. | 0070-25

Demonstrate whether there is sufficient groundwater for the lifetime of this project and other reasonably foreseeable projects; | 0070-26

Include a discussion of the potential effect of future climate change on the proposed project and groundwater resources. | 0070-27

Address what measures would be taken, and by whom, should groundwater resources in the basin become overextended due to additional growth, the influx of large-scale solar projects, drought, and/or the utilization of existing or pending water rights in the basin. | 0070-28

Describe mitigation and monitoring measures appropriate for groundwater resources. 0070-29

Consider the indirect and cumulative impacts associated with multiple large-scale solar projects proposed in the Desert Southwest on various resources, including: habitat, endangered species, groundwater, aquatic species, and air quality. | 0070-30

As an indirect result of providing additional power, it can be anticipated that this project will allow for development and population growth to occur in those areas that receive the generated electricity.

Recommendation:

The DEIS should describe the reasonably foreseeable future land use and associated impacts that will result from the additional power supply. The document should provide an estimate of the amount of growth, likely location, and the biological and environmental resources at risk. | 0070-31

Biological Resources and Habitat

EPA is concerned about the lack of information on biological resources within the project area. Prior to publication of the DEIS, no formal surveys for the detection of wildlife (mammals, birds, or reptiles) nor plants had been conducted, except for desert tortoise surveys in August

0070-25
Water Quality and Hydrology
Cumulative impacts to water resources are described in the DEIS in Section 4.19.5.

0070-26
Water Quality and Hydrology
The potential project effects on water supplies are described in the DEIS in section 4.5.2. as well as the Next Light Silver State - Groundwater Availability Study (2009). The Study modeled drawdown for two well scenarios, a 600 foot well and an 800 foot well. Under both simulations, the estimated drawdown during the operation of the project was small (less than a foot at a distance of 3 miles).

Water for the project would be obtained through an agreement with the Las Vegas Valley Water District; currently water use in the Ivanpah Valley North Hydrographic Basin for LVVWD customers is significantly lower then water commimitments. However, should the LVVWD or NDEP deem at any time that the project is impacting its ability to service its customers, then the project will be required to recharge the aquifer. The recharge would occur through rapid infiltration basins of treated effluent from the two Jean correctional facilities.

The project wells would be metered and the project would submit monthly water usage reports to the LVVWD. The LVVWD also would have access to the wells for meter reading, water quality, and water level sampling.

0070-27
Greenhouse Gases
Impacts to the proposed project or related groundwater resources from future climate change are not anticipated. Further, any impacts from climate change would be speculative.

0070-28
Water Quality and Hydrology
The Nevada State Engineer is repsonsible for allocating and managing water rights in Nevada.

0070-29
Water Quality and Hydrology
Addressed in current draft, Section 4.5.

0070-30
Cumulative Impacts

The cumulative impact analysis geographic scope was developed for each resource area and the scope is explained in Section 4.19 for each resource that may be cumulatively impacts. These boundaries were developed with the BLM to focus the analysis.

0070-31
Cumulative Impacts
Estimating potential growth and the location of that growth due to energy production from the Proposed Project would be speculative. Further, renewable energy may replace existing energy sources rather than provide energy in addition to existing energy sources in response to Renewable Portfolio Standards. Therefore, this document does not address land use and associated impacts due to additional power supply.

2008 and October 2009 (pg. 4-31; pg. 4-45). Instead, most of the information on biological resources was gathered through desktop analysis and reconnaissance, rather than protocol-level field surveys. Without more detailed information on the actual density and diversity of special status species, we cannot evaluate the direct, indirect, and cumulative impacts on biological resources. The DEIS notes that formal botanical surveys are scheduled for the spring of 2010 (pg. 4-40); formal surveys for mammals are also scheduled for the spring of 2010 (pg. 4-47). EPA believes the FEIS should include a more in-depth discussion of the project's potential impacts to biological resources.

Recommendation:
Discuss the results of the most recent field surveys (botanical, wildlife, avian, and reptile) in the FEIS. | 0070-32

As noted in the DEIS, the proposed project area contains good to excellent quality desert tortoise habitat due to its location within the Ivanpah Valley. The proposed project area is within the Northeastern Mohave Recovery Unit, one of six designated evolutionarily significant units (pg. 3-35). Surveys for desert tortoise were conducted on October 20-31, 2008 and August 26-28, 2009 (pg. 3-27)[5]. The DEIS states that all desert tortoises found within the fenced area would be translocated in accordance with BLM and U.S. Fish and Wildlife Service (USFWS) protocols. Translocation could result in adverse impacts to both the tortoises being translocated and those existing tortoises occupying the translocation area (pg. 4-52). We understand that a Biological Assessment (BA) has been prepared and was submitted to the USFWS as required by Section 7 of the Endangered Species Act. Submission of the BA initiates consultation with the USFWS. Although this information is not presented in the DEIS, we understand that the USFWS will prepare a Biological Opinion that will include additional information on translocation of the desert tortoise, including mitigation measures to minimize take.

Recommendations:
The FEIS should discuss the outcome of consultation with the USFWS. Include a copy of the BA and Biological Opinion in the FEIS. | 0070-33

Describe the location of the translocation area and the density of tortoises within this area. Discuss any associated monitoring and mitigation measures. | 0070-34

Specify, in the FEIS, the measures that will be taken to protect important wildlife habitat areas from potential adverse effects of the proposed activities. Discuss any associated monitoring and mitigation measures. | 0070-35

Climate Change

The DEIS presents a brief discussion on climate change in Section 3.1.2 but does not include measures to avoid, minimize, or mitigate the effects of climate change on the proposed project. Scientific evidence supports the concern that continued increases in greenhouse gas

[5] Note that these dates differ from the dates provided on pages 4-31 and 4-45 of the DEIS. See comment #3 under "Miscellaneous Edits" at the end of these detailed comments.

0070-32
Biological Resources
The results of the April 2010 botanical inventory have been incorporated into the FEIS.

0070-33
Biological Resources
The FEIS will include a copy of the finalized Biological Assessment. However the finalizing of the FEIS is not dependent on the completion of the Biological Opinion. However the commencement of construction of the project is dependent on the finalizing of the Biological Opinion by USFWS.

0070-34
Biology - Desert Tortoise
The final relocation/translocation plan will be outlined in the Biological Opinion that will be issued by USFWS. This plan will follow USFWS's May 2010 Translocation of Desert tortoises (Mojave Population) from Project Sites: Plan Development Guidance and will address the following issues: selection of the translocation site; selection of a control site (if five or more tortoises are to be translocated); determination of the health of tortoises (translocatees and residents); methods to be used during the translocation process; and post-translocation monitoring (minimum 5-years) of the translocated individuals. Only healthy tortoises, as determined by the results of a health assessment of each tortoise, will be translocated. Additionally, the translocation site will be located within the same habitat type and consists of a desert tortoise population of similar size and structure (genetic included) as the Project Site. To determine the success of the translocation of the tortoises, a control site of similar size, habitat, and desert tortoise population to that of the relocation site will be monitored and compared to.

0070-35
Biological Resources
There have been 14 biological mitigation measures that have been proposed, plus the applicant has proposed 17 measure addressing the monitoring and mitigation of potential impacts.

emissions resulting from human activities will contribute to climate change. Effects on weather patterns, sea level, ocean acidification, chemical reaction rates, and precipitation rates can be expected.

Recommendations:

Consider how climate change could affect the proposed project, specifically within sensitive areas, and assess how the impacts of the proposed project could be exacerbated by climate change. | 0070-36

Identify strategies to more effectively monitor for climate change impacts in the surrounding area, such as monitoring groundwater change or special status species. | 0070-37

Quantify and disclose the anticipated climate change *benefits* of solar energy. We suggest quantifying the greenhouse gas emissions that would be produced by other types of electric generating facilities (solar, geothermal, natural gas, coal-burning, and nuclear) generating comparable amounts of electricity, and compiling and comparing these values. | 0070-38

Alternatives Analysis

CEQ Regulations for implementing NEPA (40 CFR, Parts 1500-1508) state that the alternatives section of an EIS should "rigorously explore and objectively evaluate all reasonable alternatives, and for alternatives which were eliminated from detailed study, briefly describe the reasons for their having been eliminated" (40 CFR, part 1502.14). As stated in our scoping comments, reasonable alternatives should include, but are not necessarily limited to, alternative sites, capacities, and technologies, as well as alternatives that identify environmentally sensitive areas or areas with potential use conflicts. A robust range of alternatives will include more options for avoiding significant environmental impacts.

The DEIS presents two action alternatives and a no-action alternative. Both of the two action alternatives include a 400 MW PV power plant and are similar, except for a modified approach to control erosion and small changes in solar array positioning. The applicant evaluated two solar technologies, CSP and PV. CSP technology was rejected because it would require disturbing a larger area to produce the same 400 MW of renewable energy, would affect OHV routes, and would require more water. The DEIS states that one other site on BLM land was considered in the Ivanpah Valley near Jean, Nevada, but the site was less desirable because of the distance to the interconnect with Nevada and California transmission and incompatible land use. While the DEIS includes a very brief qualitative discussion (2-3 sentences) on the reasons for eliminating this alternative, it provides no detailed information on this site, except to note that it has been designated as a desert tortoise relocation area (pg. 2-6).

The DEIS states that no comments were received during scoping suggesting that the Proposed Project should have a smaller footprint or should be reduced in size (pg. 2-6). As mentioned previously (*CWA - Analysis of Alternatives*), this does not preclude the applicant from evaluating this option now. The DEIS does not specify whether tilted trackers, horizontal trackers, or fixed tilt (non-tracking) solar arrays will be utilized (pg. 2-8). Utilizing certain types

0070-36
Climate Change
Climate change is not expected to influence any of the impacts of the project. Further, any potential effect on the proposed project due to climate change would be highly speculative.

0070-37
Climate Change
Any potential impact to surrounding area due to climate change would be highly speculative. The potential effects of the proposed project on biological resources are addressed in Section 4.6. The potential effects of the proposed project on water resources are addressed in Section 4.5.

0070-38
Climate Change
A discussion of potential climate change benefits of solar energy as compared to other types of energy generation is beyond the scope of the EIS.

of tracker technology should provide the applicant with increased flexibility in project design (component layout) such that impacts can be avoided to a greater degree. Double-sided PV panels can also increase the efficiency of the system, which could provide a way to shrink the project footprint without sacrificing capacity. Such panels are in use at Nellis Air Force Base. We recommend that the FEIS analyze an on-site alternative with a reduced footprint. Defining another alternative within the project area would enable decision makers to evaluate the proposed project using a wider range of variables.

Recommendations:

Include maps of the alternative sites and a more detailed discussion regarding the reasons for elimination. Quantify potential impacts to the greatest extent practicable. | 0070-39

Specify in the FEIS whether tilted trackers, horizontal trackers, or fixed tilt (non-tracking solar arrays) will be utilized. Specify whether standard crystalline silicon modules or thin-film technology will be utilized. | 0070-40

Specify whether it is feasible to utilize double-sided PV panels to increase efficiency and reduce the project footprint. | 0070-41

Consider, analyze, and present an on-site alternative with a reduced footprint that demonstrates greater avoidance of impacts. | 0070-42

See, also, our recommendations under *Ephemeral Washes, Flood Zones, and Drainage* regarding avoidance of high flood risk areas. | 0070-43

EPA has worked closely with the DOE's National Renewable Energy Laboratory (NREL) to develop maps[6] showing contaminated lands and mining sites with renewable energy generation potential. These maps were developed in conjunction with the *RE-Powering America's Land: Renewable Energy on Contaminated Land and Mining Sites* program,[7] which was launched by the EPA Office of Solid Waste and Emergency Response (OSWER) in September 2008. Under this initiative, EPA is taking a multi-pronged approach[8] to encouraging reuse of EPA-tracked lands[9] into clean and renewable energy production facilities. EPA has developed a Renewable Energy Interactive Mapping Tool[10] that utilizes Google Earth to display these sites. We estimate that there are approximately 480,000 disturbed and contaminated sites

[6] To develop the maps, EPA and NREL collected renewable energy resource information and merged it with EPA and state data on contaminated lands and mining sites across the country. The mapping analysis applied basic screening criteria, such as distance to electric transmission lines, distance to roads, renewable energy potential, and site acreage in order to identify EPA tracked lands that might be good candidates for solar, wind, or biomass energy production facilities.

[7] For additional information on EPA's RE-Powering America's Land, please use the following weblink: http://www.epa.gov/renewableenergyland/index.htm

[8] See Internet site: http://www.epa.gov/renewableenergyland/docs/repower_contaminated_land_factsheet.pdf

[9] EPA tracks abandoned mine lands, Brownfields, Resource Conservation and Recovery Act (RCRA) sites, Federal Superfund Sites, and Non-Federal Superfund Sites.

[10] See Internet site: http://www.epa.gov/renewableenergyland/mapping_tool.htm. Open the Renewable Energy Interactive Map (KMZ) to launch the Renewable Energy Mapping Tool. More detailed information on the EPA tracked sites is available at: http://epa.gov/renewableenergyland/maps/ocpa_renewable_energy_data.xls.

0070-39
Alternatives
One other site on BLM land was considered in the Ivanpah Valley, near Jean, Nevada. The Jean site, located on a broad alluvial fan west of Interstate 15 (I-15) and south of Goodsprings Road (State Route [SR] 161), was less desirable because of the distance to the interconnect with the Nevada and California transmission systems and incompatible land use. In addition to a less desirable transmission interconnection, other factors that weighed against the Jean site included its designation as desert tortoise relocation area, the presence of the Jean Water District's well field, and potential conflicts with the proposed Southern Nevada Supplemental Airport. Due to these land use conflicts, the Jean site was eliminated from further analysis.

One suggestion raised during scoping was that the Proposed Project should be constructed in California. This alternative was eliminated from further analysis because the Proposed Project Proponent currently has several projects planned in the state of California. The Proponent believes that the Proposed Project, and those it has proposed in California and other states, as well as project other developers have proposed throughout the Southwest, will help states and the federal government meet renewable energy goals.

0070-40
Project Design
The project will use fixed-tilt trackers.

0070-41
Project Design
Double-sided PV panels are not a technology option for the proposed project.

0070-42
Project Design
The alternatives analyzed in the EIS fully satisfy the requirements of NEPA.

0070-43
Water Quality and Hydrology
Addressed in Section 4.5.2.

and almost 15 million acres of potentially contaminated properties across the United States. Many of the contaminated properties are suitable for renewable energy development and have existing transmission capacity and infrastructure in place, as well as adequate zoning. EPA strongly encourages the siting of renewable energy projects on disturbed, degraded, and contaminated sites before considering large tracts of undisturbed public lands. | 0070-44

Recommendations:

Describe the current condition of the land selected for the proposed project, discuss whether the land is classified as disturbed, and describe to what extent the land could be used for other purposes. | 0070-46

Utilize the Renewable Energy Interactive Mapping Tool to explore whether there are disturbed sites located in proximity to the proposed project and discuss this in the FEIS. | 0070-47

Purpose and Need

EPA believes the discussion in the DEIS regarding the purpose and need for the proposed Project should be expanded to include more robust information regarding the *need* for the proposed project. As indicated in our scoping comments (July 30, 2009), the DEIS should discuss the proposed project in the context of the larger energy market that this project would serve; identify potential purchasers of the power produced; and discuss how the project would assist the state in meeting its renewable energy portfolio standards and goals. Strengthening the discussion on these topics will improve the readability of the document and may also provide further justification for the project.

As presented in the DEIS, the BLM's purpose of the proposed action is to consider a ROW grant application to construct, operate, maintain, and decommission the Silver State Solar Energy project, and the need for action is based on the submittal of the ROW application to BLM. We understand that the BLM is acting under the requirements of federal mandates that encourage the use of public lands for renewable energy development. The DEIS states that BLM has considered how the proposed action fits the region's overall energy market, including economic viability, proximity to energy consumers, and transmission line capacity and reliability factors (pg. 1-2). It also presents the proponent's objective for the proposed action (pg. 1-4), which is to locate a 400 MW utility scale solar project within the State of Nevada, where it can interconnect directly into both the Nevada and California transmission systems.

We encourage BLM to revise this section of the DEIS and utilize more robust estimates of the *need* for renewable energy within Nevada in the FEIS. As a starting point, we suggest that BLM examine Governor Jim Gibbons' Nevada Renewable Energy Transmission Access Advisory Committee (RETAAC) Phase II Report (July 2009). The RETTAC Phase II Report recognizes that there is great potential for renewable energy development within Nevada and provides estimates of this potential. The report also recognizes that there is a market for renewable energy not only in Nevada, but also in surrounding states, including California. Nevada Energy signed a 25-year 50 MW power purchase agreement (PPA) with Next Light Renewable Power, LLC (pg. 3-57). We recommend that the FEIS expand the introduction to

0070-44
General
Your statement is included in the public record and will be taken into account by decision-makers when they consider the proposed project.

0070-46
Purpose and Need
Chapter 3 describes in detail the current conditions of the proposed site, including which areas are disturbed.

0070-46
Alternatives
Chapter 3 describes in detail the current conditions of the proposed site, including which areas are disturbed.

0070-47
Alternatives
The siting of the proposed project was considered through close coordination between the applicant and BLM. In addition to the site's proximity to existing utility corridors and potential customers, easy access for equipment and workers, relatively flat topography, and high solar potential, it was felt that the area had the lowest potential for significant resource conflicts.

include a discussion of how renewable energy generated at this site might be utilized to satisfy Renewable Portfolio Standards (RPS) of Nevada and nearby states, including California.

Recommendations:
Identify potential purchasers of the power produced and discuss how the project will assist Nevada and California in meeting their RPS goals.

Update the discussion regarding the *need* for the proposed project, utilizing more accurate, robust, and up-to-date references.

Hazardous Materials/Hazardous Waste/Solid Waste

The DEIS states that the Applicant will either return solar panel products to the original manufacturer or send them to a certified recycling facility after the solar PV cells are decommissioned. Solar panel material recycling and end-of-life disposal will be done in compliance with the federal, state, and local regulations (pg. 4-93).

Recommendation:
EPA is pleased to read that the applicant will develop a recycling option to address the public's concerns about an increased risk to human health or the environment. We recommend that the FEIS and Record of Decision (ROD) commit to such a measure.

Miscellaneous Edits

1. Abstract - Text states that the Proponent is proposing to construct a concentrated solar thermal parabolic trough power plant facility approximately 2 miles southeast of Primm, NV. This should be revised to state the proponent is proposing to construct a photovoltaic power plant facility, rather than a thermal parabolic trough facility. | 0070-48

2. Section 1.4.1.1 – Water Resources/Hydrology – Text lists CWA Section 301 and 402 Permitting as well as the Safe Drinking Water Act, but does not identify CWA Section 404. Text should reference and describe CWA Section 404. | 0070-49

3. Section 3.6.2.1 – Survey Methodology – notes that surveys for desert tortoise were conducted on October 20-31, 2008 and August 26-28, 2009 (pg. 3-27). Section 4.6.5 - Residual Effects – Wildlife – notes that desert tortoise surveys were conducted during August 2008 and October 2009 (pg. 4-45). Revise dates accordingly. | 0070-50

4. Section 4.6.3 – Text notes that there is the potential for ten special status plant species to occur within the proposed project area (pg. 4-40). Section 3.6.3.1 & Table 3.6-1 list only nine species. | 0070-51

5. Section 4.6.5 – Text notes that there is the potential for 16 special status reptile species to occur within the proposed project area (pg. 4-45). Section 3.6.3.2 lists & Table 3.6-1 list only 15 species. | 0070-52

0070-48
General
The text has been revised in the final EIS.

0070-49
Water Quality and Hydrology
The text has been revised in the final EIS.

0070-50
Biological Resources
The text has been revised: The correct dates of the surveys were October 2008 and August 2009.

0070-51
Biology - Plants
The text has been edited to relect the same number of special status species in section 4.6.3 as in Section 3.6.3.1.

0070-52
Biological Resources
The list of special status reptiles has been edited, the number of special status reptiles psecies in Section 3.6.3.2 & Table 3.6.1 matches the text in section 4.6.5.

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Nevada Fish and Wildlife Office
4701 North Torrey Pines Drive
Las Vegas, Nevada 89130
Ph: (702) 515-5230 ~ Fax: (702) 515-5231

June 1, 2010
File No. 84320-2009-FA-0121

Memorandum

To: Renewable Energy Project Manager, Las Vegas Field Office, Bureau of Land Management, Las Vegas, Nevada

From: Field Supervisor, Nevada Fish and Wildlife Office, Reno, Nevada

Subject: Review of Draft Environmental Impact Statement for the Silver State Solar Energy Project near Primm in Clark County, Nevada

Thank you for the opportunity to comment on the Draft Environmental Impact Statement (EIS) for the Silver State Solar Energy Project. We prepared this letter under the authority of and in accordance with provisions of the National Environmental Policy Act of 1969 [42 U.S.C. 4321 *et seq.;* 83 Stat. 852], as amended, the Endangered Species Act of 1973 [16 U.S.C. 1531 *et seq.;* 87 Stat. 884], as amended, and other authorities mandating the Fish and Wildlife Service's (Service) concern for environmental values including the National Wildlife Refuge System. Based on these authorities, we offer the following comments for your consideration:

We understand the Bureau of Land Management (BLM) would grant a right-of-way (ROW) authorizing the applicant to construct, operate, maintain, and decommission a 400-megawatt solar photovoltaic power plant on BLM-managed lands in Clark County, Nevada, 2 miles east of Primm, Nevada, along the California/Nevada state line. Under the Preferred Alternative, the project facilities would disturb a total area of 2,967.47 acres consisting of an operations and maintenance area; erosion control and stormwater drainage structures; substations, transmission lines, and interconnections; access roads; three solar fields; a perimeter fence; and a fire break. Construction would be in three phases and take place from late 2010 to the fall of 2014. The project would be designed for a life span of 30 years.

As indicated in the Draft EIS, the ROW application covers approximately 7,925 acres of BLM-managed lands. Under Alternative 2 (Preferred Alternative) project facilities and related facilities would disturb a total area of about 2,967 acres, while Alternative 3 project facilities would disturb a total area of about 4,818 acres. Since there are other pending applications for ROWs within the proposed project site (Table 3.9-1), the Final EIS should disclose the expected

0071-1

TAKE PRIDE IN AMERICA

0071-1
Project Description
FWS states that the remaining acreage (outside the footprint and infrastructure of Silver State) may be relinquished by NextLight and may allow other developers to move in. I don't think this is true. Check with Mark

status of lands within the entire 7,925 acres. It could be reasonably expected that these pending applications may be granted resulting in additional interrelated or cumulative impacts. 0071-1 Continued

Habitat loss and degradation are major threats to the recovery of the federally listed, desert tortoise (*Gopherus agassizii*) (Mojave population) and its habitat. We are concerned that the proposed projects would indirectly impact undisturbed lands in the vicinity of the project area. As indicated in the Draft EIS, the project would exclude existing public access to portions of the Jean Lake/Roach Lake Special Recreation Management Area. This area is currently used by members of the public for model rocket launching, video filming, hunting, horseback riding, hiking, off-highway vehicle (OHV) riding, music festivals, and other recreational uses. Furthermore, we do not support the construction of a new unimproved route if it would allow unregulated casual OHV use on undisturbed lands. The Final EIS should disclose the potential impacts to adjacent lands and propose measures to minimize and mitigate impacts to these areas. 0071-2

As indicated in our August 3, 2009, letter (Service File No. 84320-2009-FA-0121), we are concerned about impacts to *Penstemon albomarginatus* (white-margined beardtongue), a BLM sensitive species and a species regarded as at risk by the Nevada Natural Heritage Program. The Draft EIS referenced conducting surveys for this species in the spring of 2010, but failed to disclose direct and indirect impacts to this species. The Final EIS should disclose potential impacts to this species and provide avoidance, minimization, and mitigation measures for those impacts as appropriate. 0071-3

We recommend that BLM consider environmental impacts of each alternative and select the alternative least damaging to fish and wildlife resources as the preferred alternative in the Final EIS. We appreciate the opportunity to comment on the subject projects. Please reference File No. 84320-2009-FA-0121 in future correspondence concerning this project. If you have any questions, please contact Brian A. Novosak in the Nevada Fish and Wildlife Office in Las Vegas at (702) 515-5230.

for Robert D. Williams

0071-1 cont'd
Project Description
see previous page

0071-2
Biological Resources
Impacts to biological resources occuring on adjacent lands have been addressed by the FEIS.

0071-3
Biology - Plants
The 2010 spring botanical survey did not detect the presence of white-margined beardtongue in the Proposed Project site; the Proposed Project will not directly impact this species.

From: Michele_Bilodeau@blm.gov
Sent: Tuesday, June 01, 2010 7:16 AM
To: Doyle, James Conor; Levine, Howard
Subject: Fw: Silver State Solar Project

0072-1
General
Your statement is included in the public record and will be taken into account by decision-makers when they consider the proposed project.

Michele Bilodeau
Environmental Coordinator, RECO Group
BLM Southern Nevada District, Pahrump Field Office
Phone: 702.515.5136
----- Forwarded by Michele Bilodeau/LVFO/NV/BLM/DOI on 06/01/2010 07:16 AM -----

"Sally Armstrong" <1bigred1@sandyvalley.net>

05/20/2010 08:19 PM

To <Nextlight_Primm_NV_SEP@blm.gov>
cc
Subject Silver State Solar Project

There are 4 registered voters living in our house. We all agree that solar and wind projects should be situated all over Nevada on BLM land. We cannot believe that wind tower/turbines and/or solar panels will harm birds, tortoises, or any other desert life. In fact, those constructions would provide shade and shelter for the horses, cows, and other animals that populate the BLM land across our state.

In addition to providing renewable energy, these projects would provide thousands of jobs in the manufacturing, construction, and management industries. Building the infrastructure to carry the power would add thousands of more jobs.

These projects would also give BLM workers something constructive to do in addition to the mundane tasks of renewing leases with ranchers for grazing rights, counting tortoises, and installing signs for off-road riders.

Sally J. Armstrong
Edwin G. Armstrong
Melanie J. Armstrong
Pamela J. Hamman

0072-1

I am using the Free version of SPAMfighter.
We are a community of 7 million users fighting spam.
SPAMfighter has removed 4862 of my spam emails to date.
The Professional version does not have this message.

From: Michele_Bilodeau@blm.gov
Sent: Tuesday, June 01, 2010 7:35 AM
To: jgillenfuller@yahoo.com
Cc: Doyle, James Conor; Levine, Howard
Subject: Fw: Silver State Solar Project

Jared,

Thank you for your comments, we will ensure they are included in the FEIS.

Michele Bilodeau
Environmental Coordinator, RECO Group
BLM Southern Nevada District, Pahrump Field Office
Phone: 702.515.5136
----- Forwarded by Michele Bilodeau/LVFO/NV/BLM/DOI on 06/01/2010 07:34 AM -----

Jared Fuller <jgillenfuller@yahoo.com>

05/28/2010 06:36 PM

To nextlight_primm_nv_sep@blm.gov
cc
Subject Silver State Solar Project

The size of the Silver State solar project should be reduced significantly to lessen the cumulative impacts on multiple resources from solar projects proposed nearby in California and from the possible airport.
Resources that ought to be conserved include vegetation cover and native annual plants as well as habitat for the desert tortoise and other species of wildlife. If any rare plants are found the project should be reconfigured to exclude them. The visual impacts of the project are also of concern.

Jared Fuller
5455 N. 250 W.
Provo, Utah

0073-1

0073-1
General
Your statement is included in the public record and will be taken into account by decision-makers when they consider the proposed project.

LAS VEGAS
McCARRAN INTERNATIONAL AIRPORT

Department of Aviation

RANDALL H. WALKER
DIRECTOR

ROSEMARY A. VASSILIADIS
DEPUTY DIRECTOR

POSTAL BOX 11005
LAS VEGAS, NEVADA 89111-1005
(702) 261-5211
FAX (702) 597-9553
E-MAIL: webmaster2@mccarran.com

May 25, 2010

Mr. Gregory Helseth
Bureau of Land Management
Las Vegas Field Office
4701 North Torrey Pines Drive
Las Vegas, NV 89130-2301

RE: Comments on Draft EIS for NextLight Silver State Solar Project

Dear Mr. Helseth:

The Clark County Department of Aviation (CCDOA) submits these comments on the Draft Environmental Impact Statement (DEIS) for the NextLight Renewable Power, LLC (NextLight), Silver State Solar Project in Primm, Nevada, issued by the Bureau of Land Management in April, 2010. CCDOA looks forward to working with NextLight and with BLM and its consultants to ensure that the project can be constructed in a manner that is compatible with the proposed new Southern Nevada Supplemental Airport.

Please feel free to contact Robert Tweedy on my staff at (702) 261-5175 or roberttw@mccarran.com with questions or inquiries.

Sincerely,

TERESA R. MOTLEY, AICP
Airport Planning Manager

Encl.

cc: Randall Walker
Rosemary Vassiliadis
Robert Tweedy
Philip Rhinehart
David Kessler

Clark County Board of Commissioners
Rory Reid, Chair • Susan Brager, Vice Chair
Larry Brown • Tom Collins • Chris Giunchigliani • Steve Sisolak • Lawrence Weekly

Clark County Department of Aviation Comments

on the

Draft Environmental Impact Statement For NextLight Renewable Power LLC's Proposed Silver State Solar Project

May 26, 2010

The Clark County Department of Aviation (CCDOA) owns and operates a regional system of airports within southern Nevada, and as part of that system, is planning to construct and operate a new commercial service airport in the Ivanpah Valley (the Southern Nevada Supplemental Airport or SNSA). The proposed Silver State Solar Project in Primm, Nevada (Silver State Project) would be immediately adjacent to, and in fact would overlap in part with, congressionally-designated Airport Environs Overlay District for the SNSA. CCDOA is committed to ensuring that any new infrastructure in southern Nevada is compatible with the siting, construction, and operation of the SNSA. In light of that fact, CCDOA filed scoping comments on proposed Silver State Solar Project in which it identified several key concerns.

We appreciate the recognition of many of our scoping comments, but have remaining concerns that merit full consideration and response before Bureau of Land Management (BLM) issues its final environmental impact statement (EIS) for the Silver State Project.

1. CONSISTENCY WITH PUBLIC LAW 107-282

In Public Law 106-362, the BLM patented to Clark County a 6,000-acre site in the Ivanpah Valley (Airport Site) for the purpose of constructing and operating an airport and related infrastructure. Subsequently, in Public Law 107-282, Congress directed that an additional 17,000 acres surrounding the Airport Site (the Airport Environs Overlay District) be conveyed to the County upon final federal approval of the SNSA. As noted above, the proposed Silver State Project would intrude by a full section (Township 27S, Range 59E, Section 3) into the Airport Environs Overlay District. In light of these issues, CCDOA has the following comments on the DEIS.

- **The EIS must recognize the congressional mandate for the Overlay District in its Statement of Purpose and Need.**

  - One of BLM's "purposes" is to recognize all potentially competing legal obligations with regard to land management goals. Therefore, BLM's statement of purpose must be expanded to take into consideration Title V of the Clark County Conservation of Public Land and Natural Resources Act (Pub. L. 107-282). Specifically, BLM must consider whether the Silver State Project will interfere with the congressionally-designated

0074-1

0074-1
Consistency
The suggested wording has been included in the Final EIS.

purpose of the Airport Environs Overlay District. (*Compare,* DEIS at p. ES-1, last paragraph; DEIS at p. 1-1, § 1.1.1.1).

- Similarly, BLM's statement of "need" must include reference to all relevant federal mandates. For the above-stated reasons, in the description of applicable mandates that define BLM's "need", the list of federal laws and regulations should not be limited to renewable energy resources issues, but should include the land use mandates such as those in Title V of Public Law 107-282. (*Compare*, DEIS at p. 1-4, §1.1.1.2) 0074-2

- **The EIS must include Public Law 107-282 in the list of relevant lands and realty statutes.** In Public Law 107-282, Congress designated a 17,000 acre parcel as an Airport Environs Overlay District and directed that, upon receipt of final federal approvals for the airport project and upon request of the County, the Secretary of the Interior *must* transfer to the County all title and interest to the Overlay District subject to valid existing rights. This is relevant to the inquiry regarding land use impacts within the Overlay District because one full section of the Silver State Project will be within the Overlay District. As a result, BLM must include Public Law 107-282 in the list of relevant statutes in Section 1.4.1.8. (*Compare*, DEIS at p. 1-14, § 1.4.1.8). 0074-3

- **The EIS should recognize BLM's obligation to coordinate the terms of any relevant land use authorization with Clark County.** CCDOA appreciates the inclusion of MM LANDS-1 (*see* DEIS at p. 4-67) related to ensuring coordination between the project applicant and CCDOA. However, it is also critical that BLM coordinate the terms of its land use authorization with CCDOA. As CCDOA noted in its scoping comments, Clark County is the future owner of the Overlay District, and as such, has an inchoate interest in these lands and needs to ensure that the terms and limits on the project applicant's proposed uses of the Overlay District are consistent with CCDOA's interests in the same property. As described in further detail below, this is particularly relevant given the fact that the Silver State Project application makes clear that the project will involve the use of hazardous substances on lands that will ultimately be patented to the County.

2. AVIATION ISSUES

- **The EIS must include full discussion of FAA's regulations requiring notice of proposed construction near airports.** FAA regulations at 14 CFR Part 77 provide that any party proposing to construct a structure taller than 200 feet or within 20,000 feet of a proposed airport must provide notice to the FAA through FAA Form 7460 and receive a Determination from the FAA regarding whether the proposed structure or structures are hazards to air navigation. 0074-4

0074-2
Consistency
The suggested wording has been included in the Final EIS.

0074-3
General
The EIS has been clarified by including this Act.

0074-4
General
The information has been added to section.

- Section 1.4.1.8 of the DEIS references Part 77 regulations and states that notice is required "if any of the following criteria are met" but never includes the relevant criteria. The EIS should cite the relevant criteria from FAA's Part 77 regulations. (*Compare*, DEIS at 1-15, § 1.4.1.8). 0074-5

- In Section 2.6.6 (Construction Sequencing), the EIS should mention the fact that the applicant may be required to file Notices of Proposed Construction (FAA Form 7460) with the FAA for transmission lines and poles. (*Compare* DEIS at pp. 2-39 through 2-41 § 2.6.6) 0074-6

- The EIS must address the potential aviation-related hazards of the project. To that end, CCDOA recommends adding two issues to Section 4.14 of the DEIS as follows:

  - EFFECT HAZ-__: Because of the close proximity of the Silver State Project to the proposed SNSA, there is a possibility that the Silver State Project may constitute obstructions or hazards or may create adverse impacts on the safe and efficient use of navigable airspace. Part 77 of the Federal Aviation Regulations provides that any party proposing to construct an object or structure near a proposed public-use airport must notify the FAA before construction begins. In turn, the FAA is obligated to examine whether the structure would interfere with air navigation facilities and equipment or the navigable airspace. 0074-7
  - MM HAZ-__: The Project Applicant shall notify FAA by filing FAA Form 7460 at least 30 days before construction is to begin or the date that an application for construction permit is to be filed, whichever is earlier, and should ask FAA to opine on the issue of glare. 0074-8

- The discussion of public comments for human health and safety and hazardous materials should reference the scoping comments made by CCDOA regarding FAA's Part 77 notice obligations. (*Compare*, DEIS at p. 5-6, § 5.1.3). Of note, CCDOA raised the issue of potential glare in its scoping comments. Since then, CCDOA has met with the project applicant and reviewed evidence of similar photo-voltaic technology used without adverse effects near existing airports. 0074-9

- **<u>The EIS should correct certain references to CCDOA aviation facilities.</u>**

  - Section 3.9.2 should note the presence of Jean Airport, located just south of Jean, NV. This airport is approximately 8 miles north of the proposed project site. (*Compare*, DEIS at p. 3-59, § 3.9.2). 0074-10

0074-5
General
Your statement is included in the public record and will be taken into account by decision-makers when they consider the proposed project.

0074-6
Consistency
The EIS has been modified to include this language.

0074-7
Land Use
See Section 4.14 Human Health and Safety/Hazardous Materials Impacts
Effect HAZ-6.

0074-8
Land Use
See Table 2.9-1 Federal, State, and Local Permits tht may be Required for the Proposed Project.

0074-9
Hazardous Materials
CERCLA health and safety mandates were included in the DEIS under Section 1.4.1.11, Human Health and Safety/Hazardous Matierals. Additionally, the applicant has committed to develop and implement a SWPPP, an SPCC and Emergency Response plans as part of the proposed action design. Section 1.2.14 states "CERCLA provides a federal Superfund to clean up uncontrolled or abandoned hazardous waste sites.... the BLM may take an action to protect public land resources and users from hazardous substances that pose a threat or potential threat to human health and the environment." The new EIR/EIS for the Southern Nevada Supplemental Airport (SNSA) has not been approved and the Airport Environs Overlay District is subject to valid existing rights.

0074-10
Land Use
Your statement is included in the public record and will be taken into account by decision-makers when they consider the proposed project.

- The heliport site is located over 15 miles northeast of the NextLight Project (not 5 miles as suggested in text). (*Compare*, DEIS at p. 3-59, § 3-9-2).

0074-11

3. DRAINAGE/FLOODPLAIN IMPACTS

As CCDOA explained in its scoping comments, the SNSA will be located, in part, within the Roach Lake playa, which is the low point for a 250 square mile intrastate watershed. There is no lower ground available to which flows can be released. Therefore, stormwater management is a key planning concern for the airport.

- **The EIS must ensure that the project is designed consistent with FAA guidelines for construction near airports.** Due to the proximity of the project to a proposed international airport, any drainage or stormwater detention system should be constructed consistent with FAA's guidance for avoiding wildlife attractants near airports (FAA Advisory Circular 150/5100-33B). The EIS should also include a mitigation measure to prevent wildlife attractants near the planned airport. Per FAA's guidance, the plan should address design requirements for any flood control/drainage or water detention systems and also plans to avoid trash and debris that may attract wildlife.
  - *Compare*: DEIS at p. 4-19 § 4.4.2;
  - DEIS at p. 4-28 § 4.5.2 (MM WATER-2)
  - DEIS at p. 4-29 § 4..5.2 (Discussion of Alternative 3);
  - DEIS at p. 4-30 § 4.5.2 (Effect WATER-3);
  - DEIS at p.4-38 through 4-39 § 4.6.2; and
  - DEIS at p. 4-40 § 4.6.2 (Alternative 3 discussion).

0074-12

- **The EIS should depict the full extent of impacts to flood hazard zones.** The 100 year flood zone area is broader than just sections 11 and 2 (as indicated in Section 3.5.1.2 of the DEIS). FEMA Flood Insurance Rate Maps 32003C3500 E and 32003C3325 E show that FEMA Special Flood Hazard Areas exist within Sections 2, 3, 11, 12 & 13—all of which are included within the project area. To that end, the EIS should include a map of the FEMA Special Flood Hazard Areas for the entire Project Area. (*Compare*, DEIS at p. 3-24, § 3.5.1.2)

0074-13

- **The EIS should address impacts to Roach Lake.** MM WATER-3 should include inspection and cleanup of surface of Roach Dry Lake in Nevada (and not just Ivanpah Dry Lake in California). (*Compare*, DEIS at p. 4-28, § 4.5.3).

0074-14

4. HAZARDOUS WASTE

Pursuant to Public Law 107-282, BLM may be obligated to later convey some portion of the project site to Clark County. Therefore, the EIS should include discussion of the Comprehensive Environmental Remediation, Compensation and Liability Act (CERCLA) Section 120(h), which provides that whenever any agency of the United States enters into any contract for the sale or other transfer of real property owned by the

0074-15

0074-11

The suggested wording has been included in the FEIS.

0074-12
Biological Resources
The suggested text has been incorporated into the FEIS.

0074-13
Water Quality and Hydrology
Comment addressed in EIS. FEMA designated floorplains within the project area have been added to Figure 3.5.1.

0074-14
Water Quality and Hydrology
• MM WATER-3: Stormwater monitoring and response plan. The Applicant will develop and implement a stormwater monitoring and response plan to be used to minimize impacts from flood damage during the life of the Project. At a minimum, this plan will include:

- Visual surveys of all structures for scour following major storm events;

- Visual surveys of fencing to check for damage;

- Cleanup of broken equipment if failures do occur;

- Inspection and cleanup of downstream areas, including the surface of Ivanpah Dry Lake [and Roach Dry Lake] if debris is transported off site;

- Adaptive management of flood protection and erosion actions if the monitoring plan reveals routine damage to project structures due to flooding. Any changes must be approved by the BLM.

0074-15
Hazardous Materials
BLM will comply with all relevant laws, regulations and policies, including CERCLA prior to transferring land in the future.

United States and on which any hazardous substance was stored for one year or more, known to have been released, or disposed of, then the agency shall include in such contract notice of the type and quantity of such hazardous substance and notice of the time at which such storage, release, or disposal took place. In addition, Section 120(h) provides that each deed entered into for the transfer of such property by the United States shall contain a covenant warranting that all remedial action necessary to protect human health and the environment with respect to any such substance remaining on the property has been taken before the date of such transfer and any additional remedial action found to be necessary after the date of such transfer shall be conducted by the United States.

- **The EIS must recognize BLM's obligations under CERCLA § 120(h).**

    - The EIS should include CERCLA § 120(h) in the list of relevant human health and safety mandates listed in Section 1.4.2.10. (*Compare*, DEIS at p. 1-24, § 1.4.2.10).

    - Because there is a potential that BLM will be obligated to later convey some portion of the project site to Clark County, at which point BLM would be subject to CERCLA Section 120(h), Section 4.14.2 of the DEIS should include the following:

        - EFFECT HAZ-___: Hazardous substances may be stored for one year or more, released and/or disposed of. Pursuant to Title V of Public Law 107-282, once the federal environmental approvals for the SNSA project are issued, Clark County will have the right to request title to the 17,000-acre Airport Environs Overlay District, which includes areas within the project area. In order to ensure BLM's future ability to comply with CERCLA Section 120(h), the Applicant would be required to implement MM HAZ-__, as well as implementation of SWPP, SPCC and Emergency Response Plans.
        - MM HAZ-___: To ensure that BLM has the ability to properly comply with CERCLA Section 120(h) at such time that Clark County may request transfer of the Airport Environs Overlay District, the Applicant shall retain records of the type and quantity of hazardous substances stored for one year or more, and information regarding the time of storage, any release or disposal of hazardous substances, and a description of remedial action taken, if any.

5. AIR QUALITY

- **Climate Change/Greenhouse Gases.** The EIS should be updated to reference the final endangerment ruling and the new CEQ Draft Guidance on Consideration of Effects of Climate Change and Greenhouse Gas Emissions (2010). (*Compare*, DEIS at p. 1-8 through 1-9).

- **Construction Materials.** Has the proposed "off-site quarry" been identified and have the relevant air quality implications of transporting such materials been assessed in this EIS? (*Compare*, DEIS at p. 2-34, § 2.6.5). 0074-16

- **Attainment/Nonattainment Areas.** Text in the DEIS suggests that the project may be in a PM10 nonattainment area. The EIS should clarify that the project is not in a PM10 nonattainment area. Also, here and elsewhere in the document, it may be useful to identify the project's airshed as 164/AB (versus 212, which defines the Las Vegas Valley airshed); and that attainment and non-attainment designations are airshed designations, not county-wide designations. (*Compare*, DEIS at p. 3-5, § 3.1.1.1) 0074-17 0074-18

- **Cumulative Impacts.** The DEIS only considers projects that may have the potential to temporally overlap emissions with construction of the proposed project if they are located within one mile of the proposed project. This is inconsistent with how air quality impacts are measured. The real question is whether the projects will be in the same airshed. (*Compare*, DEIS at p. 4-127 § 4.19). Table 4.19.1 should therefore be expanded to include other relevant projects (*e.g.*, DesertXpress). 0074-19

6. **GENERAL COMMENTS**

- **BLM's multiple-use mandate.**

    - BLM has a multiple-use mandate and must consider present and potential uses of the public lands. As a result, BLM must coordinate land use planning and management with programs of the Federal departments and agencies of the States and local governments within which the lands are located. *See* 43 U.S.C. § 1712. To that end, BLM's statement of need must be broad enough to address BLM's multiple use mandate, and not just its renewable energy mandate. (*Compare*, DEIS at ES-2, first paragraph). 0074-20

    - For the above-stated reasons, the description of applicable mandates, federal laws and regulations should not be limited to renewable energy resources issues, but should include BLM's multiple-use mandate. (*Compare*, DEIS at p. 1-4, §1.1.1)

- **Migratory Bird Treaty Act (MBTA).** The Fish and Wildlife Service recently published a final rule on a revised list for Migratory Birds (Fed. Reg., March 1, 2010) which increased the number of species protected by the MBTA to 1,007. (*Compare*, DEIS at p. 1-11, § 1.4.1.5). 0074-21

- **Walter M. Higgins Generating Station.** NV Energy purchased the Reliant Bighorn Power Generating Station in April 2008 and renamed it in the fall of 0074-22

0074-16
General
An offsite quarry has not yet been identified.

0074-17
Air Quality
The text and table have been revised to discuss additional projects beyond 1 mle from the project, but within the general "airshed" of the proposed project.

0074-18
Hazardous Materials
Distances from the project site to the Kinder Morgan Calnev pipeline hand the NV Energy natural gas pipeline have been revised, and statement have been changed accordingly in the Final EIS.

0074-19
Cumulative Impacts
The text and table have been revised to discuss additional projects beyond 1 mile from the project, but within the general "airshed" of the proposed project.

0074-20
General
The suggested wording has been included in the Final EIS.

0074-21
Biological Resources
The suggested wording has been incorporated into the FEIS.

0074-22
General
The suggested wording has been included in the Final EIS.

2008. The facility is now named the NV Energy Walter M. Higgins Power Generating Station. We recommend revisions throughout the Draft EIS to use the new name. Use of the old and new names interchangeably (as occurs in the DEIS) can be confusing.

- **Firebreak.** Presumably, maintenance of the fire break would be required. The EIS should explain how frequently this would be accomplished and through what method. In addition, the EIS should also explain how, if at all, the firebreak will affect site drainage and erosion? (*Compare*, DEIS at p. 2-37, §2.6.6). 0074-23

- **Wastewater.** The EIS should explain how it will be determined if dewatering liquids are contaminated or not and whether, with the groundwater level being 100ft+ below ground surface (bgs), any dewatering is even anticipated. (*Compare*, DEIS at p. 2-49, § 2.6.7). 0074-24

- **Sewer Waste.** The EIS should confirm that sewage will be treated according to State standards and that the treatment area will be protected from flooding. (*Compare*, DEIS at p. 2-53, § 2.7.2). Also, there appears to be an order-of-magnitude discrepancy in the volume of the tank and drain field; it is likely not 200,000 gallons. If the statement later in the document is accurate, that an SNHD permit will be obtained for a small commercial septic system, this would have to be 2,000 gallons, since any volumes of 3,000 gallons or greater are permitted by NDEP, not SNHD; also, the text in Table 2.9.1 (DEIS at p. 2-66, last row) is confusing as to which agency will check the plans and issue the permit. 0074-25

- **Jurisdictional Waters.** For sake of clarity, the EIS should include a map of delineated jurisdictional waters. (*Compare* DEIS at p. 3-26, § 3.5.3). 0074-26

- **Kinder Morgan Pipeline.** The DEIS description concerning Cal-Nev Kinder Morgan pipeline is incorrect. The Cal-Nev Kinder Morgan fuel pipelines (two existing and one proposed line) are located adjacent and parallel to the Union Pacific Railroad tracks between Primm and Jean, NV, which is definitely located within 1-mile of the proposed project site. In addition, NV Energy has a 12-inch steel high pressure natural gas distribution main that extends eastward from a metering station at the Kern River Gas Transmission pipeline northwest of Primm to the NV Energy Higgins Power Generating Station. (*Compare*, DEIS at p.3-87, § 3.14.1). 0074-27

- **Operating Life of the Project.** The DEIS has inconsistent references to the expected duration of the project. (*Compare* DEIS at p. 4-112 (30 years) and DEIS at p. 2-51 (50 years)). 0074-28

0074-23
Wildland Fire and Fuels Management
The fire break would inspected at a minimum every three months. Maintenance of the fire break as stated in Section 4-18 would be accomplished by mowing the vegetation as needed to a height of 6-12 inches. The fuel break will have negligible affect on drainage and erosion.

0074-24
Water Quality and Hydrology
The potential project effects on water supplies are described in the DEIS in section 4.5.2. as well as the Next Light Silver State - Groundwater Availability Study (2009). The Study modeled drawdown for two well scenarios, a 600 foot well and an 800 foot well. Under both simulations, representing pumping during project construction and operation, drawdown was small (less than a foot at a distance of 3 miles).

Water for the project would be obtained through an agreement with the Las Vegas Valley Water District; currently water use in the Ivanpah Valley North Hydrographic Basin for LVVWD customers is significantly lower then water commimitments. However, should the LVVWD or NDEP deem at any time that the project is impacting its ability to service its customers, then the project will be required to recharge the aquifer. The recharge would occur through rapid infiltration basins of treated effluent from the two Jean correctional facilities.

The project wells would be metered and the project would submit monthly water usage reports to the LVVWD. The LVVWD also would have access to the wells for meter reading, water quality, and water level sampling.

0074-25
Water Quality and Hydrology
The suggested wording has been incorporated into the Final EIS.

0074-26
Water Quality and Hydrology
The Applicant received a preliminary jurisdictional determination from the USACE on April 8, 2010 and has requested an approved determination from the USACE. The preliminary jurisdiction determination stated that the USACE will not require a Section 404 Permit for the construction of Phase I of the Project. The Applicant will conduct a formal jurisdictional delineation prior to the construction of Phases II and III of the project once final

engineering for the location of project-specific features in these project areas is complete.

0074-27
Cumulative Impacts
The suggested wording has been incorporated into the FEIS.

0074-28
Project Description
The operational life of the project would be 50 years. The operational life of the project has been clairified throughout the document.

- **LVVWD withdrawal parameters.** The DEIS references "withdrawal parameters from the LVVWD" without explaining what those parameters are. (*Compare* DEIS at p. 4-134, § 4.19). 0074-29

- **Cultural Resources.** Section 4.19.7 states that the project will result in no impact to cultural resources. This is inconsistent with prior conclusions in the DEIS. (*Compare* Section 4.7, identifying potential effects to cultural resources). Even though effects may be mitigated, there would still be effects. 0074-30

7. **FIGURES/TABLES**

- **General**. All project area maps should depict the boundary of the 17,000 acre Airport Environs Overlay District. 0074-31

- **Table 2.3-1**. The NextLight right-of way application shows that NextLight would use Sections 1, 12, 13, 24 and 25, but Table 2.3-1 does not show any uses at all in sections 24 and 25. The EIS should address this discrepancy. 0074-32

- **Figure 2.5-1.** The following roads are discussed in Section 2.5.3, but not depicted on the map. They should be included in Figure 2.5-1. 0074-33
  - County Road
  - Perimeter Road
  - Maintenance Road
  - Solar Field Access Ways
  - Service Road.

- **Table 2-9.1.** The list of Federal, State and Local Permits should include the obligation to file FAA Form 7460 and obtain an FAA Determination prior to construction, as required by 14 C.F.R. Part 77. 0074-34

- **Table 2.10-1**.
  - The discussion of impacts to water resources should identify and discuss any potential impacts to the downgradient airport site. (*Compare* DEIS at p. 2-69). 0074-35
  - The discussion of impacts to lands and realty should identify potential impacts to the airport site and within the Airport Environs Overlay District. It should also include a discussion of consistency with Pub. L. 107-282. (*Compare*, DEIS at p. 2-72).
  - The discussion of impacts to human health and safety should identify potential aviation hazards and related mitigation. (*Compare*, DEIS at p. 2-76).

- **Table 3.1-2.** The table should be updated to reflect the proposed range of standards for 8-hour ozone. (*Compare*, DEIS at p. 3-4). 0074-36

0074-29
Water Quality and Hydrology
Withdrawl paramaters refers to the amount authorized to the project. Under the terms of the LVVWD's Water Service Agreement, the District will supply the anticipated water needs for the project (600 acre-feet total over four years of construction with no more than 200 acre feet needed in any given year and a maxium of 21 acre-feet per year during project operations). In turn, the project will be required (if/when deemed necessary by the LVVWD or NDEP to sustain adequate supplies for its service users) to recharge 270 acre-feet per year of treated effluent back into the aquipher.

0074-30
Cultural Resources
Section 4.19.7 discusses cumulative impacts to cultural resources eligible for the NRHP. In Chapter 4.7, cultural resources eligible for the NRHP would be avoided by the project, resulting in no impact to the resources.

0074-31
Land Use
The map has been revised.

0074-32
Project Description
Table 2.3-1 has been revised.

0074-33
Maps
Figure 2.5.1 has been updated.

0074-34
Consistency
Table 2.9-1 has been revised.

0074-35
Water Quality and Hydrology
The volume of runoff leaving the project is not anticipated to substantially vary from pre-development; therefore no potential impacts to the airport site are expected.

0074-36
Air Quality
The table has been revised accordingly.

- **Tables 3.1.4 and 3.1.5**. The tables should report the years associated with the monitor values. The tables should report hourly NO_2 values, if available, in light of the new 1-hour NAAQS. Table 3.1-5 should reflect what monitors this data reflects. The note to Table 3.1-5 also refers to the Mojave Desert Air Quality Management District without reference to why that California regulatory agency is relevant. DAQEM is the relevant agency and the monitors should be consistent between tables. 0074-37

- **Figure 3.19.** 0074-38
  - "Project B" is incorrectly described/depicted. Please make following corrections:
    - The Ivanpah Airport Site (currently owned by Clark County) is approximately 6,000 acres (not 3,734.5 acres). (*Compare* acreage as correctly described in the DEIS on p. 3-118.)
    - The "application" for the 6,000 acre airport site is no longer "pending". BLM patented the land to Clark County in 2004.
    - The Figure does not correctly depict the boundary of the 6,000 acre airport site.
    - The Figure should depict the 17,000-acre noise compatibility area that is currently undergoing NEPA review. (*Compare* existing reference to the Overlay District (NVN 088003) in Table 3.9-1)
  - The figure should include Sloan Hills Mineral Material Sales Project (currently pending) and the Southern Nevada Regional Heliport (approved).

- **Table 3.19-1**. BLM should include the Southern Nevada Regional Heliport and the Sloan Hills Mineral Materials Sales Project to the table of projects considered within or near the Ivanpah Valley. 0074-39

- **Table 4.19-4**. How is the "contribution percentage of proposed actions to cumulative impacts" derived (*i.e.*, what was the total acreage considered? What is the boundary of the total acreage considered? NV only? CA only? BLM should include a map for clarity. 0074-40

* * *

0074-37
Air Quality
Tables 3.1.4 and 3.1.5 have been revised to include monitoring data from representative stations in Clark County. Nevada (these stations are referenced in footnotes in the tables. These tables have also been updated to include 1-hr NO2 monitoring data.

0074-38
Cumulative Impacts
Figure 3.19-1 has been been revised.

0074-39
Cumulative Impacts
The Sloan Hills Mineral Materials Sales Project and the Southern Nevada Regional Heliport were not added because they are outside the cumulative impact study area.

0074-40
Cumulative Impacts
Figure 3.19-1 shows the projects and the boundaries considered. Acreages are calculated by ROW, as explained in Table 4.19-1 footnotes.

LIONEL SAWYER & COLLINS

ATTORNEYS AT LAW

1700 BANK OF AMERICA PLAZA

300 SOUTH FOURTH STREET

LAS VEGAS, NEVADA 89101

(702) 383-8888

FAX (702) 383-8845

lsc@lionelsawyer.com

www.lionelsawyer.com

SAMUEL S. LIONEL
GRANT SAWYER
(1918-1996)

JON R. COLLINS
(1923-1987)

RICHARD H. BRYAN
JEFFREY P. ZUCKER
PAUL R. HEJMANOWSKI
ROBERT D. FAISS
DAVID N. FREDERICK
RODNEY M. JEAN
HARVEY WHITTEMORE
TODD TOUTON
CAM FERENBACH
LYNDA S. MABRY
MARK H. GOLDSTEIN
KIRBY J. SMITH
COLLEEN A. DOLAN
JENNIFER A. SMITH
DAN R. REASER
PAUL E. LARSEN

ALLEN J. WILT
LYNN S. FULSTONE
RORY J. REID
DAN C. McGUIRE
JOHN E. DAWSON
FRED D. "PETE" GIBSON, III
CHARLES H. McCREA JR.
GREGORY E. SMITH
MALANI L. KOTCHKA
LESLIE BRYAN HART
CRAIG E. ETEM
TODD E. KENNEDY
MATTHEW E. WATSON
JOHN M. NAYLOR
WILLIAM J. McKEAN
ELIZABETH BRICKFIELD
GREGORY R. GEMIGNANI
LINDA M. BULLEN
LAURA J. THALACKER
DOREEN SPEARS HARTWELL
LAURA K. GRANIER
MAXIMILIANO D. COUVILLIER III

MICHAEL D. KNOX
ERIN FLYNN
JENNIFER ROBERTS
MEREDITH L. STOW
DOUGLAS A. CANNON
RICHARD T. CUNNINGHAM
MATTHEW R. POLICASTRO
JENNIFER J. DIMARZIO
PEARL L. GALLAGHER
CHRISTINE D. SMITH
SUSAN L. MYERS
BRIAN S. PICK
JENNIFER L. BRASTER
LUCAS J. TUCKER
CHRISTOPHER WALTHER
KEVIN J. HEJMANOWSKI

KETAN D. BHIRUD
LAUREN D. CALVERT-ARNOLD
ROBERT W. HERNQUIST
CHRISTIAN HALE
TIMOTHY R. MULLINER
COURTNEY MILLER O'MARA
BRIAN H. SCHUSTERMAN
MOHAMED A. IQBAL, JR.
KELLY R. KICHLINE
MARK J. GARDBERG
ELIZABETH A. HIGH
JAMES B. GIBSON
GREG J. CARLSON
ABIGAYLE F. OANG
JING ZHAO

OF COUNSEL
RICHARD J. MORGAN*
ELLEN WHITTEMORE
CHRISTOPHER MATHEWS
MARK A. CLAYTON

*ADMITTED IN CA ONLY

WRITER'S DIRECT DIAL NUMBER
(702) 383-8970

LBULLEN@LIONELSAWYER.COM

June 1, 2010

VIA ELECTRONIC MAIL AND HAND DELIVERY

Mr. Greg Helseth
Renewable Energy Project Manager
U.S. Bureau of Land Management
4701 N. Torrey Pines Drive
Las Vegas, Nevada 89130

Re: Comments of NextLight Renewable Power, LLC on the Draft Environmental Impact Statement for the Silver State Solar Energy Project

Dear Mr. Helseth,

NextLight Renewable Power, LLC ('NextLight"), herewith submits it comments on the Draft Environmental Impact Statement ("DEIS") for the Silver State Solar Energy Project. While NextLight's full set of comments is set forth in the spreadsheet included as Attachment A to this letter, NextLight has several key issues which merit highlighting, and which are detailed in this cover letter. Those issues are as follows:

On page 4-86, paragraph 1, the DEIS states that "Applicant will require 50 percent of construction work force to carpool or vanpool." NextLight understands the environmental and traffic concerns which resulted in this statement. However, this requirement is not based on any analysis, while traffic issues will be thoroughly evaluated and adequately addressed in the context of the Clark County Development Agreement process. The County process, which evaluates traffic impacts is the more appropriate forum for this issue, and traffic impacts will be adequately addressed in the County process through a traffic mitigation plan following careful evaluation of the traffic impacts. NextLight abide by any traffic mitigation plan imposed by the

0075-1

0075-1
Transportation and Traffic
Your statement is included in the public record and will be taken into account by decision-makers when they consider the proposed project.

County and will encourage carpooling and vanpooling, as indicated in the attached comments, but vigorously objects to the imposition of any such requirement.

With regard to off highway vehicle ("OHV") use, NextLight wishes to emphasize, as discussed in NextLight's April 18, 2010 Preliminary Comments to the DEIS (attached hereto as Attachment B), that it has made accommodations for OHV use in the vicinity of the proposed project, and it is imperative that those accommodations be accurately reflected in the FEIS.

NextLight also wishes to reiterate its preference for tortoise relocation over translocation as it develops its compliance plans following the FEIS. In addition, NextLight wishes the record to reflect that it intends to implement as a feature of the berm design, the preservation of drainage and wash "edges" to the maximum extent feasible.

NextLight thanks you for the opportunity to provide comments on the DEIS, and invites any comments the BLM may have on these comments.

Best Regards,

Linda M. Bullen

Linda M. Bullen
Lionel Sawyer & Collins
Attorneys for NextLight Renewable Power, LLC

0075-2
Biology - Desert Tortoise
Your statement is included in the public record and will be taken into account by decision-makers when they consider the proposed project.

0075-3
Water Quality and Hydrology
The berms would be constructed in line with the natural flow direction of the washes in the project area with breaks in the berms to allow upslope flow to enter into the larger drainages. Each natural flood corridor proposed to be lined by berms is comprised of multiple washes. The berms would be set back from all channel banks to allow the washes to meander within the confines of the berm.

ATTACHMENT A

COMMENTS OF NEXTLIGHT RENEWABLE POWER, LLC ON DRAFT ENVIRONMENTAL IMPACT STATEMENT FOR SILVER STATE SOLAR ENERGY PROJECT						
Comment No.	Name of Person commenting	Chapter	Page	Paragraph	Proposed Revision and Comment	E&E Response/Revision
1	NL	Abstract	1	2	**Replace:** "concentrated solar thermal parabolic trough" with "photovoltaic solar" **Comment:** Clerical.	
2	NL	Abstract	2	1 (Carry over from page 1) Also, cover page and 1-1	**Replace:** "Two" step-up transformers" with "step-up transformers. **Comment**: The number of step up transformers within the substations will be determined during the detailed design phase of the project.	
3	NL	ES-1	1	2	The BLM actions that require NEPA analysis are to approve or deny the ROW application (NVN-085077). **Amend to add:** As amended by NVN-085801.	
4	NL	ES	6 thru 11	Various	The DEIS points users to sections 4.1.3 through 4.1.17 for further discussion of each section listed. These references are incorrect and need to be updated to match the table of contents.	
5	NL	ES	ES-7	5	**Replace with:** "No Federally listed species were observed within the Project site during botanical surveys conducted in the Spring of 2010. One species, Death Valley ephedra, was observed at numerous locations on the Project site and individuals would be impacted by construction of the Proposed Project. This species is on the Nevada Natural Heritage Program's watch list", **Comment:** The Spring botanical survey was conducted and a technical report of the results submitted to BLM. This statement accurately reflects the 2010 botanical survey results.	
6	NL	ES	ES-9	4	**Replace with:** A temporary bypass route would be designated by BLM to enable backcountry access during construction of the county road. The Proposed Project service road would allow continued casual OHV access to the Lucy Grey mountains. **Comment:** This more accurately states the relationship of the Proposed Project to casual recreation use.	
7	NL	ES	ES-9	5	**Replace with:** Organized OHV events would be re-routed onto the Proposed Project's Interior Maintenance Road to allow continued use of traditional routes used by these events. Casual OHV use would be able to use the Proposed Project's service road for access to the Lucy Grey Mountains. Construction of Alternative 2 would result in an increase in the level of use of other parts of the Jean Lake/Roach Lake SRMA by members of the public engaged in recreational model rocket launching, movie, commercial, and music video filming, big game hunting, horseback riding events, hiking, and music festivals since this portion of the SRMA would no longer be available to the public. Although some recreational users in the Jean Lake/Roach Lake SRMA would no longer have access to the Proposed Project site, the analysis indicates that it would not cause substantial overcrowding by having a "spill over" effect to other recreational areas. **Comment:** This revision more accurately states NextLight's agreement with the OHV community.	
8	NL	ES	ES-12	6	**Replace with:** Casual OHV activity would be directly affected by renewable energy projects because access through these project sites would be prohibited. However, casual OHV users would utilize the Proposed Project's service road to access to the Lucy Grey Mountains and organized OHV events would maintain traditional courses through the use of the Proposed Project's interior maintenance road. **Comment:** More accurately reflects agreement with the OHV community.	

COMMENTS OF NEXTLIGHT RENEWABLE POWER, LLC ON DRAFT ENVIRONMENTAL IMPACT STATEMENT FOR SILVER STATE SOLAR ENERGY PROJECT						
Comment No.	Name of Person commenting	Chapter	Page	Paragraph	Proposed Revision and Comment	E&E Response/Revision
9	NL	1	1-4	4	Insert "and Purpose" after "Objective" in caption and in first line of text. Insert "photovoltaic" before "solar" in first line of text. Insert after final sentence: "The site of the Proposed Project will minimize environmental impacts, infrastructure needs, and costs by being located near existing infrastructure, and the Proposed Project will contribute to the local economy by creating employment opportunities, tax revenues and expenditures in local businesses. The Proposed Project will also help displace older, fossil-fuel electric generating facilities with clean, renewable power, which will contribute to the reduction of greenhouse gas emissions. In addition, the Proposed Project furthers the objectives of the Federal government to eliminate or reduce greenhouse gas emissions and promote the deployment of renewable energy technologies."	
10	NL	2	2-5	Table 2.2-1	**Remove:** Rows labeled as "Unimproved solar field access ways", "34.5-kV line" and "Other ancillary facilities and site disturbance" from the table. **Comment:** These rows were incorrectly listed as having different values for the two alternatives. The disturbances associated with these three rows in the table will be the same under both alternatives. The remaining rows properly characterize the actual disturbance differences between the alternatives.	
11	NL	2	2-5	Table 2.2-1	Access ways and perimeter road should be included on components list.	
12	NL	2	2-5	Insert after Para. 2	In accordance with Title 40 CFR Section 1502.4, and consistent with BLM's NEPA Handbook, alternatives were not carried forward for further analysis if the alternative: i) is ineffective (that is, if it would not respond to the BLM's purpose and need); ii) is technically or economically infeasible; iii) is inconsistent with the basic policy objectives of the Las Vegas RMP/EIS; iv) if implementation is remote or speculative; v) is substantially similar in design to an alternative that is analyzed; or vi) would have substantially similar effects to an alternative that is analyzed.	
13	NL	2	2-6	Insert after Table 2.2.2	CSP technology was initially considered by the applicant, but because of the water demands of this technology, it was rejected early in the NEPA process and was, therefore, eliminated from future analysis.	
14	NL	2	2-6	Insert below caption "Alternative Location"	During its siting process, applicant utilized a refined set of criteria to select a site for potential development. The criteria included: superior solar resource; sufficient contiguous land; minimal sensitive plant or animal presence; available water and infrastructure; available or obtainable site control; availability of qualified labor; and overall economic viability.	
15	NL	2	2-11	4	**Replace** "...driven piers approximately "4 inches in diameter" with "...driven piers approximately 4-8 inches in diameter," which correctly reflects foundation diameter.	
16	NL	2	2-14	3	**Replace** "...driven piers approximately "4 inches in diameter" with "...driven piers approximately 4-8 inches in diameter," which correctly reflects foundation diameter.	

COMMENTS OF NEXTLIGHT RENEWABLE POWER, LLC ON DRAFT ENVIRONMENTAL IMPACT STATEMENT FOR SILVER STATE SOLAR ENERGY PROJECT						
Comment No.	Name of Person commenting	Chapter	Page	Paragraph	Proposed Revision and Comment	E&E Response/Revision
17	NL	2	2-17	2.4.4	Table 2.4-4. Photovoltaic Technology Comparison Row titled "Single-axis tracker systems" should be renamed "Mounting Systems." Row titled "Tracker foundations" should be renamed "Foundations." Row for "pad-mounted inverters" in the Fixed Tilt column should read "800" not "400". **Replace with:** "800" with "0" in the row labeled "Drive motor foundations" in the column labeled "Fixed Tilt Panels". **Comment:** This is an error. There are no drive motor foundations for the fixed tilt configuration. **Replace with:** "Concrete ballasts" with "Concrete piers" in the row labeled "Foundation" in the column labeled "Horizontal Tracker". **Comment:** This is a clerical error. **Replace with:** "4 inches in diameter" with "4-8 inches in diameter" in the row labeled "Dimensions of foundations," which correctly reflects foundation diameter. **Add:** "2) Driven Piers, 4-8 inches in diameter, 10 feed deep (below ground)" to the row labeled "Dimensions of foundations" in the row labeled "Tilted Tracker". Comment: The DEIS correctly refers to embedded piers on page 2-8, but omitted them from the table on page 2-17.	
18		2	2-18	1	Proposed Project Access Road and alternate access road should include electric distribution and communications lines.	
19	NL	2	2-21	1	**Replace** "and two 50-percent-rated transformers" with "and one or two transformers". **Comment:** The transformer configuration within the substations will be determined during the detailed design phase of the project.	
20	NL	2	2-22	1	**Add to end of paragraph:** "Prior to construction of the 230kV transmission line to NV Energy, the associated right-of-way will be utilized for the temporary installation of a 12kV construction power feed. The temporary 12kV constructibo power feed will be removed when the 230kV transmission line is completed." **Comment:** Correctly reflects planned construction.	
21	NL	2	2-24	1	**Replace:** "Institution of Electrical Engineers" with "Institute of Electrical and Electronics Engineers (IEEE)". **Commeot:** Clerical.	
22	NL	2	2-24	4	**Add:** After paragraph 4, just before the heading "Perimeter Road", "The Access Road will include the installation of telecommunications lines within the road right-of-way." **Comment:** Correctly reflects planned construction.	
23	NL	2	2-25	1	**Replace:** "No off-site material would be used to harden the access ways." with "BLM-approved materials would be used to harden the access ways". **Comment:** Correctly reflects planned construction.	
24	NL	2	2-26	6	**Replace:** "Berms 1, 2, 4 and 5 would be constructed within the sular array" with "Berms 1, 2, 4, and 5 would be constructed within the solar field area". **Comment:** Improves clarity.	
25	NL	2	2-26	7	**Replace:** "except for at-grade road crossings to permit" with "except for at-grade crossings and/or crossings with culverts to permit". **Comment:** The delineation report for the jurisdictional waters indicated that culverts were acceptable for crossing existing washes if needed to ensure stormwater flow.	
26	NL	2	2-29	4	"Construction access roads would typically be 20 feet wide, with 6-foot-wide crushed rock shoulders". **Change** to "Construction access roads will be 40 feet wide", which is the correct width.	

COMMENTS OF NEXTLIGHT RENEWABLE POWER, LLC ON DRAFT ENVIRONMENTAL IMPACT STATEMENT FOR SILVER STATE SOLAR ENERGY PROJECT						
Comment No.	Name of Person commenting	Chapter	Page	Paragraph	Proposed Revision and Comment	E&E Response/Revision
27	NL	2	2-32	2	**Remove** reference to an on-site batch plant. **Comment:** The Proposed Project will meet concrete requirements from existing batch plants in the area. **Change to:** "To provide concrete for PV module foundations and other uses, an off-site ready mix plant would be used."	
28	NL	2	2-34	1	**Change:** "…vegetation would be re-planted on the southern berm of each wash…"to "...vegetation could be re-planted on the southern berm of each wash…" **Comment:** Not yet determined if re-vegetatioo will be	
29	NL	2	2-35	7	**Delete:** "This well would be capped and abandoned in compliance with all federal and state regulations governing well abandonment." **Comment:** The well will not be capped or abandoned after construction but will continue to be used for fire control and other site uses. The well will be capped and abandoned at the end of the life of the project in accordance with all applicable standards, or in the event that the project is not approved. The wells drilled for construction were always intended to remain to supply the operational needs of the Proposed Project.	
30	NL	2	2-35	6	DEIS states that "Water rights to Basin 164-A would be purchased from the Las Vegas Valley Water District (the District) to allow the drilling of two oo-site wells." **Correction:** Water will be purchased from LVVWD under an agreement with the District. Water rights will not be purchased from LVVWD.	
31	NL	2	2-37	1	**Replace:** "to a height of 6 to 12 inches" with "to a height of less than 12 inches". **Comment:** Correctly reflects planned construction.	
32	NL	2	2-39	2	**Replace:** "The area(s) would be backfilled, compacted, and leveled, followed by the application of 6 inches of 10,000 tons of concrete uniformly grade aggregate rock." with "uniformly graded aggregate material at a depth of 6 inches". **Comment:** The depth, not weight, of rocks is the relevant determination.	
33	NL	2	2-46	4	**Replace:** "Year-Round" with "Year-Round (if required)." **Comment:** Measure will only be implemented year-round if required.	
34	NL	2	2-52	7	**Replace:** "to a height of 6 to 12 inches" with "to a height of less than 12 inches". **Comment:** Correctly reflects height.	
35	NL	3	3-26	3	**Remove:** the items "the substation", "access roads", "service road", "berms", "parking areas", "water storage pond" and "O&M building" from the parenthesized facilities list. **Comment:** These facilities will not be built in jurisdictional waters.	
36	NL	3	3-71	3.12-2	Table 3.12-2. Key Observation Points: VRM Class column should be populated.	
37	NL	3	3-85	3.13.2	**Insert:** Access to site will be via at-grade or above-grade crossing. **Comment:** Correctly reflects project plan.	
38	NL	3	3-121	3	The DEIS states that "[m]any of the impacts associated with wind generation facilities result from their large footprint." This statement is somewhat deceptive in that it fails to take into account that wind projects, while initially having a large footprint, ultimately do not disturb large, contiguous, tracts of land.	
39	NL	3	3-121	4	As with the previous comment, because the overall contiguous footprint of wind facilities is not significant, the impact of permanent displacement of wildlife is not significant.	

COMMENTS OF NEXTLIGHT RENEWABLE POWER, LLC ON DRAFT ENVIRONMENTAL IMPACT STATEMENT FOR SILVER STATE SOLAR ENERGY PROJECT						
Comment No	Name of Person commenting	Chapter	Page	Paragraph	Proposed Revision and Comment	E&E Response/Revision
40	NL	3	3-121	5	The positive impact on local economies from renewable energy projects exceeds just the labor force. For example, local economies benefit from taxes paid by the project proponent over the life of a project.	
41	NL	4	4-4	4	The Proposed Project would have positive effects on climate change resulting from a reduction in greenhouse gas emissions to the extent that it replaces fossil fuel electric generating facilities.	
42	NL	4	4-5	1	Replace: "…for which the areas…" with "…for which the area…". **Comment**: Clerical.	
43	NL	4	4-5	6	**Replace current language with:** "O&M would require the use of vehicles and equipment including trucks for on-site welding and panel washing, and crane trucks for minor equipment maintenance. Additional maintenance equipment would include forklifts, manlifts and chemical application equipment for weed abatement and soil stabilizer treatment." **Comment:** Refueling would not be done on site, and there would be no bioremediation area on site.	
44	NL	4	4-10	2	**Replace DEIS text with:** "The Applicant shall install acoustic barriers around stationary construction noise sources as necessary to maintain a noise level not to exceed 85 dBA at the property boundary closest to the nearest residence." **Comment:** The revised MM NOI-4 ensures compliance with Clark County Code provisions regarding noise.	
45	NL	4	4-11	4	**Comment:** The Desert Oasis Apartment Complex is located more than 1.4 miles from the North and South Substations.	
46	NL	4	4-12	5	**Delete:** There would be an increase in local traffic noise resulting from workers traveling to and from the site during construction (up to 700 daily trips by workers, plus up to 112 trips for construction vehicles) and approximately 1,039 construction vehicles would be in use the at work site each day over the 48-month construction period. **Comment:** This refers to construction impacts which are short term not long term.	
47	NL	4	4-13	1	Based upon conclusion that sound level at closet receptor is 55 decibels (dB) at the closest receptor, noise mitigation should not be required.	
48	NL	4	4-16	5	**Delete**: The fencing surrounding the facility would impede some or all of the debris flow during a flash flood event. The Applicant would perform maintenance after major storm events to remove debris that may have accumulated against the fencing and to repair any damage to the fencing; **Comment:** The Proposed Project fencing does not cross major drainages. Rather perimeter fencing surrounds each solar panel island.	
49	NL	4	4-16	5	GEO-3 Reference to fence surrounding the facility incorrect. **Comment**: Fence would be constructed in a manner that excludes drainage areas.	
50	NL	4	4-17	2	MM GEO-2: Applicant's Insurance Coverage. The Applicant shall acquire the appropriate insurance coverage to address potential off-site damage to structures or injury to people by facility structures that are moved off-site by a geologic event such as an earthquake or flash flood event.	
51	NL	4	4-19	1	To reduce the potential for water-driven erosion, the Applicant has designed an erosion control and stormwater flow system.	

COMMENTS OF NEXTLIGHT RENEWABLE POWER, LLC ON DRAFT ENVIRONMENTAL IMPACT STATEMENT FOR SILVER STATE SOLAR ENERGY PROJECT						
Comment No	Name of Person commenting	Chapter	Page	Paragraph	Proposed Revision and Comment	E&I Response/Revision
52	NL	4	4-22	1	**Replace:** "A water service agreement with LVVWD was scheduled for LVVWD Board approval in February 2010." with "A water service agreement has been executed with LVVWD." **Comment:** Status update.	
53	NL	4	4-24	3	**Replace:** "to a beight of 12 inches" with "to a height of less than 12 inches". **Comment:** Correctly reflects heigbt.	
54	NL	4	4-25	3	**Replace with:** "This plan must be approved by the BLM prior to the beginning of project construction." **Comment:** There is no benefit from or requirement to have the plan approved three months in advance of construction.	
55	NL	4	4-28	5	**Replace with:** The flood control plan must be approved by BLM prior to beginning of project construction. **Comment:** There is no benefit from or requirement to have the plan approved three months in advance of construction.	
56	NL	4	4-48	1, Bullet 1	**Replace**: Steel post foundations (8 to 12 feet in depth) in flood-prone areas would be designed to withstand 1.5 feet of scour; **Comment:** Louis Berger report findings are that maximum scour for post foundations is 1.5 feet and 4 feet for ballast foundations. Consistent with the Berger findings, post foundations should be design to withstand 1.5 feet of scour not 4 feet.	
57	NL	4	4-28	3	**Replace with:** The stormwater monitoring and response plan must be approved by BLM prior to beginning of project construction. **Comment:** There is no requirement or benefit from having the plan approved three months in advance of construction.	
58	NL	4	4-31	3	**Replace with:** Applicant conducted a botanical reconnaissance and desktop evaluation for the Proposed Project area in 2009. Subsequently, the Applicant conducted botanical surveys during the Spring of 2010. **Comment:** Paragraph updated to reflect completion of botanical survey and submittal of report to BLM.	
59	NL	4	4-40	4-6 (continued on 4-41) 4	**Comment:** The section headed "Sensitive Plant Species" needs to be revised to reflect the results of the Spring 2010 botanical survey and the submission of the technical report to BLM. No special status plant species were observed on the Proposed Project site. Death Valley ephedra was observed on the Proposed Project site. This plant is listed on the Nevada Natural Heritage Project's Watch list.	
60	NL	4	4-46 to 4-47	4	**Comment:** The Proposed Project will employ relocation to the maximum degree possible. The USFWS protocol for relocation/translocation of desert tortoise requires that the tortoise populations in the relocation/translocation sites be determined ahead of time to prevent overcrowding. Thus, the statement: "Impacts would be extensive, as well, because the translocated individuals would most likely impact the fitness of the desert tortoise that occupy the translocation site," is not supported by the tortoise relocation/translocation protocol that will be used by the project.	

COMMENTS OF NEXTLIGHT RENEWABLE POWER, LLC ON DRAFT ENVIRONMENTAL IMPACT STATEMENT FOR SILVER STATE SOLAR ENERGY PROJECT						
Comment No.	Name of Person commenting	Chapter	Page	Paragraph	Proposed Revision and Comment	F&T Response/Revision
61	NL	4	4-31	7	Section states that "other relevant environmental documents for projects occurring in the same vicinity as the Eldorado to Ivanpah Transmission Project (EITP) were reviewed to assure consistency with impact analyses and proposed mitigation, including the Ivanpah Solar Electric Generating System (ISEGS) Final Staff Assessment (FSA) DEIS prepared by the California Energy Commission (CEC), and the joint BLM and California Public Utilities Commission Draft Environmental Impact Report (DEIR)/DEIS for the EITP." **Comment:** Neither the California Energy Commission nor the California Public Utilities Commission has jurisdiction over any aspect of the Silver State Project. Consequently, the regulations of these agencies, and any mitigation measures imposed or impacted analyses conducted pursuant to the regulations of these agencies, are not applicable to the Silver State Project. Suggest deletion of entire paragraph as irrelevant to this project.	
62	NL	4	4-46	4 to 4-47 Para 1	The desert tortoise discussion on pages 4-46 to 4-47, makes a conclusory statement that all "adverse impacts on desert tortoise would occur with the implementation of the Proposed Project and the APMs." The DEIS contains no documentation supporting this conclusion, and should be deleted, particularly because it is not based on site-specific conditions or information related to the potential translocation site.	
63	NL	4	4-57	1-5	**Comment:** The Army Corps of Engineer's Jurisdictional Determination was issued on April 8, 2010. and the section headed "Jurisdictional Waters, Drainages, and Riparian Areas" should be revised to reflect receipt of the jurisdictional determination.	
64	NL	4	4-57	3	**Remove** the items "the substation", "access roads", "service road", "berms", "parking areas", "water storage pond" and "O&M building" from the parenthesized facilities list. **Comment:** These facilities will not be built in jurisdictional waters.	
65	NL	4	4-58	BIO-1	**Replace:** MM BIO-1: Preconstruction Surveys. Preconstruction surveys will be conducted by qualified biologists according to the most current USFWS protocols, where available, by species. These surveys will include surveying mowing areas, brush clearing areas, and ground disturbance areas within habitat deemed suitable for sensitive species by a qualified biologist. These surveys will be conducted for the presence of special status plants, the presence of noxious weeds, and the presence of general and special status wildlife species, to prevent direct loss of vegetation and wildlife and to prevent the spread of noxious plant species. If construction is initiated in the before June 30, 2011, botanical surveys conducted in Spring 2010 shall be accepted as the Preconstruction plant survey. **Comment:** Reliance on the Spring 2010 botanical survey is required to initiate construction in 2010 or early 2011.	
66	NL	4	4-61	BIO-15	**Replace:** Applicant will conduct a formal jurisdictional delineation within the boundaries of the Project area once final engineering for the location of project-specific features is complete. This will be conducted prior to construction of Phases II and II to obtain 404 permits required to construct these phases. **Comment:** A preliminary jurisdictional determination was received by ACOE on April 8, 2010, and the ACOE has indicated that they would not require a 404 permit for construction of Phase I.	

COMMENTS OF NEXTLIGHT RENEWABLE POWER, LLC ON DRAFT ENVIRONMENTAL IMPACT STATEMENT FOR SILVER STATE SOLAR ENERGY PROJECT						
Comment No	Name of Person commenting	Chapter	Page	Paragraph	Proposed Revision and Comment	E&E Response/Revision
67	NL	4	4-68	6	**Replace:** The Proposed Project would be constructed within the boundaries of the Jean/Roach Lake SMRA. The Proposed Project would be constructed on several trails used for hiking and recreational and competitive OHV use. The Proposed Action would continue to provide OHV users and other recreationists access to the backcountry by means of the Project's Service Road. Organized competitive OHV events would use the Project's Interior Maintenance Road to maintain the continuity of the traditional race course. **Comment:** The revised paragraph more accurately reflects plans for continued recreation use in the vicinity of the Proposed Project.	
68	NL	4	4-71	6	**Replace:** Access to the Proposed Project site would be via the Project Access Road, a new 1.55-mile, 40 foot wide road constructed and maintained (including necessary lights and crossing gates at the Union Pacific Railroad [UPPR] crossing) by Clark County as a public road. A temporary bypass route would be designated by BLM to enable backcountry access during construction of the county road. Casual OHV uses would utilize the Project's Service Road to continue this use in the Proposed Project area. The Service Road would extend along the northern boundary of the Proposed Project site across Section 1, and then south within Sections 1 and 12. At this point, it would connect to the existing OHV road that provides access to the Lucy Gray Mountains. Organized competitive OHV events would utilize the Proposed Project's Interior Maintenance Road to maintain the continuity of the traditional race course. **Comment:** The revised paragraph more accurately reflects plans for continued recreation use in the vicinity of the Proposed Project.	
69	NL	4	4-72	2	**Replace:** Construction of this alternative would not prevent OHV users from being able to access the backcountry. The OHV route currently used to access the backcountry would be realigned and available to OHV use prior to construction. Organized competitive OHV events would utilize the Proposed Project's Interior Maintenance Road to maintain the continuity of the traditional race course. Although some recreational users in the Jean Dry Lake/Roach Dry Lake SRMA would not have access to the Proposed Project site, it would not cause substantial overcrowding by having a "spill over" effect on other recreation areas. **Comment:** The revised paragraph more accurately reflects plans for continued recreation use in the vicinity of the Proposed Project.	
70	NL	4	4-72	3	**Replace:** Operations and Maintenance. O&M for Alternative v2 would result in the same effects as construction. During O&M, the Proposed Project Site would remain fenced and would be off limits to members of the public. OHV users and other recreationists would continue to have access to backcountry by means of the Project's service road and the competitive organized OHV events would utilize the Proposed Project's Interior Maintenance Road to maintain the continuity of the traditional race course; however, members of the public engaged in recreational model rocket, movie, commercial, and music video filming, big game hunting, horseback riding events, biking, and music festivals would not have access ot the Proposed Project site, itself. **Comment:** The revised paragraph more accurately reflects plans for continued recreation use in the vicinity of the Proposed Project.	
71	NL	4	4-86	1	Deliveries of materials will be scheduled for off-peak hours to reduce effects during periods of peak traffic. **Add:** "to the extent practicable."	

COMMENTS OF NEXTLIGHT RENEWABLE POWER, LLC ON DRAFT ENVIRONMENTAL IMPACT STATEMENT FOR SILVER STATE SOLAR ENERGY PROJECT						
Comment No.	Name of Person commenting	Chapter	Page	Paragraph	Proposed Revision and Comment	E&E Response/Revision
72	NL	4	4-86	1	**Comment:** "Applicant will require 50 percent of construction work force to carpool or vanpool" to "Applicant will encourage construction workforce carpooling or vanpooling."	
73	NL	4	4-86	1	**Modify MM TRAN-1 from:** "Deliveries of materials will be scheduled for off-peak hours to reduce effects during periods of peak traffic" to "Deliveries of materials will be scheduled for off-peak hours to reduce effects during periods of peak traffic to the extent practical" **Modify MM Tran-1 from:** "Applicant will require 50 percent of the construction workforce to carpool or vanpool " to "Applicaot will encourage the construction workforce to carpool or vanpool and will adhere to any traffic restrictions contained in the Clark County Development Agreement." **Comment:** Clark County is currently conducting a public services review of the Proposed Project and has not identified any traffic related issues. The above conditions are excessively burdensome on the Proposed Project given the ability of I-15 to accommodate high volumes of traffic.	
74	NL	4	4-98	1	**Modify MM HAZ.-5 from** "Remove any flammable wastes generated during construction, including organic matter from vegetation clearing, on a regular basis" to "Remove any flammable wastes generated during construction on a regular basis. Vegetation clearing shall be accomplished in a manner that reduces vegetation in a manner that doesn't create a fire hazard." **Comment:** Given the low volume of fuel on the site and its reduction to small pieces during the clearing operation, this material cao remain on the site without creating a fire hazard. The condition should modified to require Applicant to reduce vegetation during clearing so as not to create a fire hazard.	
75	NL	4	4-98	11	**Replace** "in compliance with the NBC" with "in compliance with the NEC and NFSC". **Comment:** The National Electrical Safety Code (NESC) has authority over power generation facilities while the NEC has authority over inhabited buildings on the project site.	
76	NL	4	4-111	2	**Replace:** "coiffures" with "coffers." **Comment:** Clerical.	
77	NL	4	4-125	3	**Replace:** "mowed to between 6 and 12 inches" with "mowed to less than 12 inches". **Comment:** Change correctly reflects planned construction.	
78	BC	4	4-127	3	Only the Projects within 1 mile of the Proposed Action that would be emitting contaminants concurrent with construction of the Proposed Action are considered potential contributors to cumulative impacts. These include the EITP and the Calnev Pipeline Expansion Project and have the potential to temporally overlap emissions with construction of the Proposed Project because they are located within 1 mile of the Proposed Project. However, the construction schedules of these projects are uncertain and may not coincide with the Proposed Project.	
79	NL	4	4-127	4	**Add sentence to end of paragraph:** "Additionally, these are linear projects and construction activity would be dispersed and not concentrated in the vicinity of the Proposed Project. **Comment:** The linear nature of these projects would cause minimal air impacts.	
80	NL	4	4-128	1	AIR-1 Analysis assumes all EITP and Calves activity is concentrated at the project site. In Noise, DEIS states Calnex will move at a rate of 2-miles per day. EITP will occur over a 25 mile stretch. Hard to see how impacts would be significant for more than a few days.	

COMMENTS OF NEXTLIGHT RENEWABLE POWER, LLC ON DRAFT ENVIRONMENTAL IMPACT STATEMENT FOR SILVER STATE SOLAR ENERGY PROJECT						
Comment No	Name of Person commenting	Chapter	Page	Paragraph	Proposed Revision and Comment	F&E Response/Revision
81	NL	4	4-134	Continuation of Paragraph 5 from 4-134	Given the nature of renewable projects, it is difficult to understand how the projects proposed in the Ivanpah and Eldorado Valleys would result it hundreds of thousands of acres becoming impervious. The derivation of this number should be reviewed.	
82	NL	4	4-139	Table 4.19.3	Table uses 7,937.2 acres of disturbance. This is incorrect. The correct number of acres is 2,967. The text following Table 4.19.3 should globally reflect this change.	
83	NL	4	4-141	4.19-4	Table uses 8,373 acres of disturbance. This is incorrect. Should be 2,867 acres and discussion should be revised accordingly. Also the other numbers in the table seem to be grossly inflated. 8.63 percent should be reduced to 5%.	
84	NL	4	4-141	Paragraph 3 and Table 4.19-4	**Comment:** The Proposed Action acres are 2,967 acres not 8,373 acres stated in Table 4.19-4. A probable explanation is that the 61,323,4 acres includes wind projects that tend to have localized impacts over a large area and, therefore, have minimal impact on wildlife habitat. Additionally, applications for solar rights of way tend to include more acreage than will actually be developed to allow design flexibility. The impacts of solar projects should not be evaluated on gross acrey. Rather, they should be based on the layout drawing of the solar project in the POD. The analysis in this paragraph should be redone and the paragraph rewritten to provide a more realistic estimates of the cumulative impacts on wildlife from renewable energy projects.	
85	NL	4	4-142	1	The statement that potential impacts are potentially significant is an unsubstantiated assertion. The project includes mitigation measures designed to reduce impacts to a level of non-significance. It is reasonable to that the other projects would also include similar mitigation measures. Recommend replacing "are potentially significant "with "contributes to cumulative impacts".	
86	NL	4	4-142	1	**Comment:** This analysis ignores the existence of the Clark County HCP and other planning efforts in California and Nevada to conserve desert tortoise habitat. For example, in California efforts are underway to designate the Mother Road National Monument that would preserve over a million additional acres of Mojave desert habitat. This proposal is cumulative with the Mojave National Monument and other preserves which protect wildlife habitat over a large percentage of the Mojave Desert. This discussion fails to acknowledge what has been done and what is being done to preserve habitat for desert tortoise and other desert species in the Mojave Desert.	
87	NL	4	4-142	2	**Comment:** The 2010 Spring botanical survey did not observe any white margin penstomen on the project site. Therefore the project would not contribute to cumulative impact on this species.	
88	NL	4	4-144	5	**Revise the last sentence:** Casual OHV activity would not be allowed within the Proposed Project site. Casual OHV users would be able to use the Project's Service Road to access the Lucy Gray Mountains. Organized competitive OHV events would use the Project's Interior Maintenance Road to maintain the continuity of the traditional race course.	

COMMENTS OF NEXTLIGHT RENEWABLE POWER, LLC ON DRAFT ENVIRONMENTAL IMPACT STATEMENT FOR SILVER STATE SOLAR ENERGY PROJECT						
Comment No.	Name of Person commenting	Chapter	Page	Paragraph	Proposed Revision and Comment	E&E Response/Revision
89	NL	4	4-145	3	BLM would designate a temporary bypass route to enable backcountry access during construction of the county road. Casual OHV use will be able to use the Project's Service Road to allow this use to continue in the vicinity of the Proposed Project area. The Service Road would extend along the northern boundary of the Proposed Project site across Section 1, and then south within Sections 1 and 12. At this point, it would connect to the existing OHV road that provides access to the Lucy Gray Mountains. Organized competitive OHV events would utilize the Proposed Project's Interior Maintenance Road to maintain the continuity of the traditional race course. Comment: The revised paragraph more accurately reflects plans for continued recreation use in the vicinity of the Proposed Project.	
90	NL	4	4-152	1	MM TRAN-1 will require the Applicant to limit the use of northbound I-15 on Fridays from noon to 10:00 p.m. MM TRAN-1 is unwarranted and should be eliminated because transportation issues were addressed by Clark County in the context of the County's Special Use Permit and no such conditions were imposed upon NextLight in the course of the Special Use Permit approval process.	
91	NL	4	4-152	1	**Replace:** MM TRAN-1 provides measures that reduce Applicant's impact on traffic and reduce the Proposed Project's incremental contribution to cumulative traffic impacts. **Comment:** This citation of MM-TRAN-1 is not consistent with MM TRAN-1 on Page 4-86. Limiting vehicles to 15 trips every 15 minutes would have a significant and unnecessary impact on the Applicant's ability to construct the Proposed Project.	
92	NL	4	4-158	3	**Replace:** "mowed to between 6 and 12 inches" with "mowed to less than 12 inches". **Comment:** This change correctly reflects mowing height.	

ATTACHMENT B

NextLight
Renewable Power, LLC

MEMORANDUM

From:	Michael Hatfield, Director of Development
To:	Greg Helseth, Bureau of Land Management
Cc:	John Egan, Bill Chilson, Linda Bullen
Date:	April 18, 2010
Subject:	**Silver State Solar Project EIS Preliminary Comments**

Mr. Helseth:

Thank you for the opportunity to provide the BLM with our preliminary review of the Draft Silver State Solar Project EIS. A key issue we want to highlight for BLM's attention relates to OHV use, as we believe there is an inconsistency between the Plan of Development submitted by NextLight and the Draft EIS. As you know, this issue received considerable attention at the scoping hearings, and NextLight has in fact designed the Project to allow continued racing and casual use.

The DEIS states the following (***emphasis*** added):

- Executive Summary, p. ES-9, Recreation: The Draft EIS states that "the annual Primm 300 race, held during the fall, would be rerouted outside of the Proposed Project site ..."

This is not correct. In fact, NextLight's POD (Jan 2010) proposes to make its paved interior maintenance road available for OHV races as noted below (***emphasis*** added): | 0075-4

Section 5.1.5. Recreation and Off Road Vehicle Accommodation

"NextLight has proposed a ***revised route through the solar field*** that uses the paved maintenance road. Speeds would be regulated within the solar field for safety. The revised route has been reviewed and is acceptable to BLM, the Southern Nevada Off-Road Enthusiasts (SNORE), and the Terrible Herbst Corporation, which operates the Primm Resort. Scheduled competitive events will continue to be regulated by BLM permits issued to event sponsors."

353 Sacramento Street, Suite 2100, San Francisco, CA 94111 | MAIN 415 935 2500 FAX 415 935 2501 | www.nextlight.com

0075-4
Project Description
The suggested wording has been included in the Final EIS.

The DEIS also states the following (***emphasis*** added):

- Executive Summary, p. ES-12, Recreation: "Casual OHV recreational activity would not be allowed within solar fields."

NextLight agrees that OHV activity would not be allowed within the solar field; however, we want to clarify that the Project has been designed to accommodate continued casual use on the service road around the northeast perimeter of the Project, as noted in our POD: 0075-5

Section 5.1.5, Recreation and Off Road Vehicle Accommodation

"Casual OHV users will be able to use the service road around the northern and eastern perimeter of the Project to maintain traditional access to the Lucy Gray Mountains."

We understand that the BLM will revise the DEIS to clarify these points, and that we will include an exhibit at the DEIS hearings to provide such clarification to the public.

We offer the following additional preliminary comments:

- Introduction, PDF p. 5, Last paragraph: Change "concentrated solar thermal parabolic trough power plant" to "solar photovoltaic power plant". 0075-6
- Section 2.4.4, p. 2-17, Table 2.4.4: Row for "pad-mounted inverters" in the Fixed Tilt column should read "800", not "400".
- Section 2.5.2, p. 2-24, Paragraph 1, line 2: Change "Institution of Electrical Engineers" to "Institute of Electrical and Electronics Engineers".
- Section 2.6.6, p. 2-35, Water Wells: Well will not be capped and abandoned after construction. The wells will continue to be used for operation.
- Section 4.2.2, p. 4-10, Paragraph 1 notes nearest residence is 1.4 miles. However, MM NOI-3 requires notification of residences within 1-mile of site.
- Section 4.2.2, p. 4-11, North and South substations cannot be both 1.4 miles from the nearest residences. South substation is on the order of 2.5 miles distance from the nearest residences.
- Section 4.6.8, p. 4-57, Jurisdictional Waters: Discussion incorrectly includes project components that are not within jurisdictional waters.
- Section 4.15.2, p. 4-102, the DEIS references 350 as the maximum workforce throughout the document (including the basis for trips in the traffic analysis). The project description

0075-5
Recreation
The suggested wording has been included in the Final EIS.

0075-6
General
The suggested wording has been included in the Final EIS.

states 230 to 400, as does one other section of the document (Noise). This creates some inconsistency and although just an estimate, it should be consistently referenced. 0075-7

- Section 4.19.5, p. 4-135, WATER-1 Statement "The other foreseeable projects could result in construction of hundreds of thousands of acres of impervious or semi-impervious surface" is not supported by the facts, and we believe, greatly overestimates any actual impacts.
- Section 4.19.6, p. 4-139, Table 4.19.3: 7,937.2 acres of disturbance should be 2,967 acres. Discussion should be revised accordingly.
- Section 4.19.6, p. 4-141, Table 4.19.4: 8,373 acres of disturbance should be 2,867 acres. Discussion should be revised accordingly.
- Section 4.19.6, p. 4-141, Table 4.19.4: 8.63% Contribution of the Proposed Actions to Cumulative Impacts should be reduced to 5%.

Finally, as a general comment, the EIS is written as though it is an EIR, including use of CEQA's Appendix G significance criteria, which is not relevant to the Federal actions under environmental review for this Project. Numerous times the text concludes that "as such, a complete assessment of the residual effects cannot be determined." Since CEQA does not apply, this is not a necessary conclusion based on NEPA requirements to use the best available information to assess impacts. What the text in question should say is that, based on available information, impacts have the potential to occur and that BMPs/MMs X, Y and Z would be implemented to address those impacts. 0075-8

We look forward to discussing these with you, and will be providing more detailed comments during the public hearing process.

Sincerely yours,

Michael A. Hatfield
Director of Development

MAH:adl

0075-7
General
The suggested wording has been included in the Final EIS.

0075-8
General
We have clarified the terminology used in the EIS to ensure that analyzes impacts using proper NEPA terminology. The more appropriate term is impact indicator(s) rather than significance criteria. Thank you for your comments.

NVEnergy

JUNE 16, 2010

GREGORY HELSETH
RENEWABLE ENERGY PROJECT MANAGER
U.S. BUREAU OF LAND MANAGEMENT
PAHRUMP FIELD OFFICE
4701 N. TORREY PINES DRIVE
LAS VEGAS, NEVADA 89130

SUBJECT: NV ENERGY COMMENTS ON SILVER STATE SOLAR PROJECT DRAFT EIS

Dear Mr. Helseth,

NV Energy is an investor-owned utility covering over 54,000 square miles across southern and northern Nevada serving 2.4 million customers. NV Energy holds authorizations from the BLM for over 1000 rights-of-way (ROWs) within the states of Nevada, California, Utah and Arizona, over 600 of which are in southern Nevada. NV Energy's southern territory covers most of Clark County and a portion of Nye County, which includes most of the lands within the jurisdictional boundary of the U.S. Bureau of Land Management's (BLM) Southern Nevada District Office.

The comments herein address concerns related to the Draft Environmental Impact Statement (DEIS) for the Silver State Solar Energy Project (NVN 085077) and are specific to groundwater withdrawal of 21 acre feet per year (AFY) of permanent long-term supply and 600 AFY of groundwater withdrawal for construction purposes with no more that 200 AFY withdrawn in any one year.

NV Energy is concerned that the proposed project could adversely affect its Walter M. Higgins Generating Station's (Higgins) water supply wells that are within 0.5 mile of the proposed pumping center(s). As written, the analyses completed in the DEIS water resources sections does not appear to meet industry standards for evaluating the effects of the proposed project's groundwater withdrawal on existing and adjacent water rights owners and water users in the region. With Higgins being in close proximity to the proposed project, it is important that the appropriate level of groundwater evaluation be completed to effectively analyze effects to adjacent water rights owners and users. In the DEIS, there appears to be missing information, analyses, and results to back up the interpretations. For example, the DEIS states that there will only be local and short-term effects, or groundwater withdrawal would not adversely affect water supply or cause drawdown. The comments we provide below focus on water resource concerns, and we request that missing information and results be included in the Final EIS.

NV Energy supports an appropriate level of groundwater analysis in the EIS that presents the effects to adjacent water rights owners and users resulting from groundwater withdrawal by the project in the region. We would like to point out that NV Energy staff has met with NextLight staff to discuss the concerns we are presenting in this letter and we will continue to coordinate with NextLight on these concerns to ensure no adverse effect to Higgins operations occurs.

P.O. BOX 98910, LAS VEGAS, NEVADA 89151-0001 6226 WEST SAHARA AVENUE, LAS VEGAS, NEVADA 89146
P.O. BOX 10100, RENO, NEVADA 89520-0024 6100 NEIL ROAD, RENO, NEVADA 89511 nvenergy.com

Specific comments are as follows:

Page 2-19 Figure 2.5-1 Site Map

Please show the proposed locations of the two wells: one construction well and the one permanent well and any alternative sites for groundwater withdrawal.

Page 2-35, Section 2.6.6 Proposed Project Water Supply

Consistent with the assertion on Page ES-6 and in Section 4.5.2, please state that the total use in any one year shall not exceed 200 acre feet rather than the statement "The maximum volume of construction water in any given year is not expected to exceed 200 acre feet."

Page 3-25, Section 3.5.2 Groundwater Resources

Please note that NV Energy's Walter M. Higgins Generating Station uses treated effluent from the Primm Casinos wastewater treatment plant and leases groundwater from four Primm-owned wells. The four wells, which are within about 0.5 miles of the proposed project's two water supply wells, are crucial to the successful operation of the Higgins generating station.

Page 3-26, Section 3.5.2.2 Water Use and Discharge

Regarding the statement, "One site (well) is sourced by effluent from the Primm Wastewater Treatment Plant and permitted for power and water storage at the adjacent NV Energy Walter M. Higgins Power Generating Station", please note that treated effluent from the Primm Casinos wastewater is not associated with groundwater from any of the four Higgins-leased wells.

Page 4-21 Section 4.5.2 Direct and Indirect Effects by Alternative
Effect WATER-1

Please provide additional detail, information, results, and interpretations supporting the statement "....Applicant analyzed 23 wells in the immediate vicinity of the Proposed Project to determine the required well depth and assess water supply and draw down effects."

Please provide detailed information, results, and interpretations to support the statement, "The well analysis concluded that water consumption for the Project would not adversely affect water supply or cause draw down, with the use of temporary storage pond."

Please note that in addition to LVVWD's approval for use of their water rights, NDWR must approve a water rights change of location application for the proposed project's use.

Page 4-22 Section 4.5.2 Direct and Indirect Effects by Alternative
Effect WATER-1

The statement, "Effects to drawdown would only be a concern during peak water usage for dust suppression," is contrary to the statement on the previous page of the application (and discussed above). We request that the applicant provide the information, results and interpretations for the groundwater analysis completed as part of its EIS analysis.

The application also includes the statement, "With the temporary storage pond system described above, effects to groundwater draw down would be localized and short-term." We

0076-1

Water Quality and Hydrology
The locations of proposed and existing wells are shown on Figures 2 and 3 of the NextLight Silver State - Groundwater Availability Study.

0076-2

Project Description
The suggested wording has been included in the Final EIS.

0076-3

Water Quality and Hydrology
The suggested wording has been included in the Final EIS.

0076-4

Water Quality and Hydrology
The availability of groundwater for the project was analyzed in the Next Light Silver State - Groundwater Availability study (2009), which used computer modeling to simulate two well scenarios (a 600 foot deep well and an 800 foot deep well) for both project construction and operations. The Study also looked at existing data for 23 wells in the project vicinity; all well data was provided by the Nevada Division of Water Resources.

Under both simulations, representing pumping during project construction and operation, drawdown during the operation (long term) of the project was small (less than a foot at a distance of 3 miles from the well). Under an extreme peak demand scenario (continuous pumping of 550,000 gal/day during project construction), drawdown at 200 feet from the 600 foot deep well was simulated at about 19 feet; drawdown 200 feet from the 800 foot deep well was about 10 feet.

0076-5

0076-6

0076-7

The estimated 550,000 gal/day scenario corresponds to filling water trucks periodically during a day. However, the instantaneous groundwater withdraw will be reduced by pumping groundwater to a pond. The pond will have a volume of about 2 million gallons. Were the peak demand to persist for 10 days, the demand could be satisified with a groundwater pumping rate of 240 gal/min and utilization of the storage within the pond. While such an extended demand is unlikely, it defines an upper boundary to the required groundwater-pumping capacity.

0076-8

0076-6
Water Quality and Hydrology
The suggested wording has been included in the Final EIS.

0076-7
Water Quality and Hydrology
The potential project effects on water supplies are described in the DEIS in section 4.5.2. as well as the NextLight Silver State - Groundwater Availability Study (2009). The Study modeled drawdown for two well scenarios, a 600 foot well and a 800 foot well. Under both simulations, representing pumping during project construction and operation, drawdown during the operation (long term) of the project was small (less than a foot at a distance of 3 miles from the well). Under an extreme peak demand scenario (continuous pumping of 550,000 gal/day during project construction), drawdown at 200 feet from the 600 foot deep well was simulated at about 19 feet; drawdown 200 feet from the 800 foot deep well was about 10 feet.

The estimated 550,000 gal/day scenario corresponds to filling water trucks periodically during a day. However, the instantaneous groundwater withdraw will be reduced by pumping groundwater to a pond. The pond will have a volume of about 2 million gallons. Were the peak demand to persist for 10 days, the demand could be satisified with a groundwater pumping rate of 240 gal/min and utilization of the storage within the pond. While such an extended demand is unlikely, it defines an upper boundary to the required groundwater-pumping capacity.

0076-8
Water Quality and Hydrology
The instantaneous groundwater withdraw demand will be reduced by pumping groundwater to a temporary storage pond during project construction. The pond will have a volume of about 2 million gallons. During peak construction demand, the water trucks would be filled from the pond, thereby decreasing the pumping demand on the well. For example, if a peak construction demand of 550,000 gal/day were to persist for 10 days, the demand could be satisified with a groundwater pumping rate of 240 gal/min and utilization of the storage within the pond. While such an extended demand is unlikely, it defines an upper boundary to the required groundwater-pumping capacity.

The potential project effects on water supplies are described in the DEIS in section 4.5.2. as well as the Next Light Silver State - Groundwater Availability Study (2009). The Study modeled

drawdown for two well scenarios, a 600 foot well and a 800 foot well. Under both simulations, representing pumping during project construction and operation, drawdown during the operation (long term) of the project was small (less than a foot at a distance of 3 miles from the well). "Short Term" is quantified as a period of "days".

request a detailed explanation to support this statement as to how the temporary storage pond system can have an influence on drawdown and how this is related to being local or short-term. In addition, local and short-term effects should be further defined/described, to include the criteria by which local or short-term water level or water quality changes are acceptable.

Page 4-25 Section 4.5.2 Direct and Indirect Effects by Alternative
MM WATER-1

Groundwater monitoring (water levels and water quality) and a groundwater monitoring plan should be included as mitigation or BMP in pre- and post-construction documents as well as part of project operations to support the analysis of effects.

Page 2-69 Table 2.10.1

Based on revisions made to the water resources section, Table 2.10.1 may need to be revised accordingly.

NV Energy appreciates the opportunity to provide these comments associated with the Draft Environmental Impact Statement (DEIS) for the Silver State Solar Energy Project. Please contact me at (702) 402-5669 or via email at slacy@nvenergy.com should you have any questions.

Sincerely,

Starla Lacy

Starla Lacy
Executive - Environmental, Health and Safety

0076-9

0076-9
Water Quality and Hydrology
The water storage pond would be used to supplement the main groundwater well should extreme water demands occur during project construction. The 200 foot by 140 foot temporary storage pond would be excavated and lined, with a capacity of approximately 2 million gallons of water. During peak construction demand, the Applicant would pump water out of the pond, thereby decreasing the amount needed to be pumped from the groundwater well. Pumping less water from the well, while supplementing water need from the pond, will decrease the potential for downdraw in the aquifer. Should the quantity or quality of other water be compromised for other users in the District during project construction or operation, the Applicant would be required to recharge the aquifer with treated effluent water. The extent and duration of potential downdraw from pumping of the main groundwater well is described in the Next Light Silve State - Grounwater Availability Study (2009). Based on the simulation of peak pumping (the maximum rate potentially needed under peak construction demand) over 10 days, for a 600 foot deep well, the simulated drawdown in the well is 190 feet. After 4 years of construction pumping, the drawdown in the project well was predicted at about 110 feet and the drawdown at a distance of 3 miles from the well was less than a foot. After 50 years of construction and then operational pumping, the drawdown in the project well is about 11 feet and the drawdown 3 miles from the well is still less than 1 foot. Additional local and/or short-term impacts to water quantity and water quality are described in the EIS in section 4.5.2.

0076-10

0076-10
Water Quality and Hydrology
Under the terms of the LVVWD Water Service Agreement, the project wells will be metered and the project will be required to submit monthly water use reports to the District during both project construction and operation. The District will also have access to the wells for meter reading, water quality, and water level sampling.